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22 SEPTEMBER 1986

USSR REPORT  
LIFE SCIENCES  
BIOMEDICAL AND BEHAVIORAL SCIENCES

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SPACE BOTANY APPLICATIONS OF DISCOVERY ABOUT CELL DIVISION

Moscow MEDITSINSKAYA GAZETA in Russian No 50, 20 Jun 86 p 4

[Article by R. Akhmetov, correspondent]

[Excerpt] On June 19, a scientific discovery made by Moscow scientists who are associates of the Medical Institute No 2 and of the Institute of Medical-Biological Problems of the USSR Ministry of Health was registered at the USSR State Committee on Inventions and Discoveries. Docent N. L. Delone and doctors of biological sciences V. V. Antipov and G. P. Parfenov discovered a fundamentally new phenomenon: impairment of the mechanism of cell division in conditions of zero gravity.

"We demonstrated for the first time that zero gravity affects such a basic biological process as cell division," related Professor V. V. Antipov. It was found that division is impaired in approximately 3 percent of the cells of plants, from the effect of zero gravity.

"American researchers who flew in space confirmed the results of our scientific discovery.

"The same phenomenon was subsequently recorded by other Soviet scientists in muscle cells of turtles and rats and in cells of flies and beetles. Interestingly, cells that divided normally produced new generations of cells with the same percentage of impairments.

"I wish to emphasize that the loss of such a small number of cells does not affect the viability of an organism as a whole or any aspects of its vital activity. Experiments on board spacecraft have demonstrated that all stages of plant development--germination of seeds, formation of primary organs, blooming, and maturation of seeds--can take place normally in zero gravity.

"Work on development of closed ecological systems presumably will become more intensive in the future, considering the prospects for further study and exploration of space with the aid of orbiting stations. A priority of this work will be development of space hothouses which will assume the function of partially regenerating the atmosphere inside orbiting stations, and the plants grown in them will be used in crews' food rations. Hothouse cultivation in space is precisely where results of the scientific discovery will be particularly applicable. We are studying possible mechanisms of hereditary transmission of cell impairments in conditions of zero gravity, as well as predisposition of cells to this phenomenon."

FTD/SNAP

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CSO: 1840/1253-E

## NEW DATA ON INTERFERON

Moscow TASS in English 9 Jun 86

[Text] During their space missions, cosmonauts increase the content in their blood of interferon, an organic compound generated by the human body as a response to the emergence of infection. This has been corroborated by post-flight checkups of 42 Soviet cosmonauts. It has been established that under the conditions of the extra-terrestrial medium, deviations from normal in the body can be considerable: concentration of interferon increase eight times in some cosmonauts, writes the journal PRIRODA.

Interferon was dispatched to space aboard the station Salyut-6 for six months. Its biological activity did not deteriorate in this time. Therefore specialists recommended interferon to space crew members for use as a medicine.

The journal writes that the USSR uses interferon produced from cells of human placenta and from pig blood. The cheapest and most effective is the so-called recombinant interferon produced by genetic engineering under the leadership of academician Yuri Ovchinnikov. It is now under testing and will be ready for use in two or three years.

/5915

CSO: 1840/1247-E

CURRENT STATUS AND TRENDS IN CROP PROTECTION FROM HERBICIDES

Moscow AGROKHIMIYA in Russian No 4, Apr 86 pp 107-136

[Article by M. R. Pitina, N. L. Poznanskaya, V. K. Promonenkov and N. I. Shvetsov-Shilovskiy]

[Abstract] A review of largely Western literature is provided on the adverse impact of herbicides on crops, and of the methods that are being taken or considered to protect crops from herbicides. The basic intention is to optimize herbicide use in a manner compatible with crop safety and high yields. Some of the approaches to this problem deal with devising better methods of herbicide applications, design of more selective herbicides, and the breeding of resistant crops. Other research efforts concentrate on adsorbents such as activated charcoal, clay, inorganic salts, or ion-exchange resins that would neutralize the effects of herbicides after use. Equally important are studies on the use of antidotes, chemical agents that would weaken or abolish the toxic effects of herbicides on crops, yet not affect their efficacy against weeds. Finally, of more recent interest are developments in microbiology on the use of various microbial preparations for the decomposition or transformation of herbicides into nonphytotoxic products. References 412: 2 Polish, 24 Hungarian, 25 Russian, 346 Western, and others.

12172/5915  
CSO: 1840/2261

CHEMICALIZATION OF AGRICULTURE IN RSFSR

Moscow AGROKHIMIYA in Russian No 4, Apr 86 p 137

[Review by A. V. Peterburgskiy and S. V. Vinogradova, of book by A. V. Postnikov and V. A. Markov, KHIMIZATSIYA ZEMLEDELIYA RSFSR, Moscow, Rosselkhozizdat, 1984, 238 pp]

[Abstract] This manual on chemicalization of agriculture in the RSFSR has the advantage that its style is rather in the popular vein, and thus readily accessible to the vast army of agricultural workers. It covers both the theoretical foundations and practical aspects of using chemicals for improving soil productivity. The use of natural and mineral fertilizers is discussed in detail, and encompasses technological, agricultural, economic and administrative problems and solutions. A considerable part of the book deals with

mechanization of the transportation, storage and application of fertilizers. The authors failed to emphasize the fact that the use of fertilizers should be based on sound agricultural judgment relating to the crops and local conditions to yield maximum dividends and be cost-effective. However, on the whole, the few shortcomings of the book do not detract from its generally solid coverage of the chemical aspects of agriculture in the RSFSR.

12172/5915  
CSO: 1840/2261

UDC 635.656(571.13)

#### SOYBEAN CULTIVATION IN OMSK OBLAST

Novosibirsk SIBIRSKIY VESTNIK SELSKOKHOZYAYSTVENNOY NAUKI in Russian No 1, Jan-Feb 86 (manuscript received 8 Apr 85) pp 18-21

[Article by N. I. Vasyakin and V. U. Nechayeva, candidates of agricultural sciences, Siberian Scientific Research Institute of Agriculture]

[Abstract] Studies were conducted in the Omsk Oblast to determine best conditions for the cultivation of soybean crops in the area, with data analyzed for the period 1981-1983. Planting time was found to be critical for good harvests of Omsk-3 soya. In warm years with daily increases in temperature, optimal harvests were obtained with crops planted by May 10, whereas in years with slow warming of the soil late planting (May 24-31) is preferred. Optimal harvests were also favored by planting in rows at 45 cm separation, with 0.6-0.8 million germinating seeds per hectare. Under the boghara conditions of Western Siberia the rapidly maturing Omsk-3 variety can be expected to give harvests of 10-15 centners/ha even in dry years. Tables 2.

12172/5915  
CSO: 1840/2254

UDC 632.766.43

#### REGULATORY ROLE OF ENTOMOPATHOGENIC FUNGI IN POPULATIONS OF WHEAT THRIPS

Novosibirsk SIBIRSKIY VESTNIK SELSKOKHOZYAYSTVENNOY NAUKI in Russian No 1, Jan-Feb 86 (manuscript received 25 Jun 85) pp 26-30

[Article by M. Ts. Rakshaina, candidate of biological sciences, and N. N. Gorbunov, candidate of agricultural sciences, Siberian Scientific Research Institute of Agriculture and Chemicalization of Agriculture]

[Abstract] A survey was conducted on wheat thrips (*Thrips tritici*) collected in Novosibirsk Oblast in 1977-1979 to determine the level of infection with fungi. The collated data showed that, on the average, 20-26% of the imagos were infected with fungal spores, and 35-88% of the larval forms. The fungi

were identified as *Tarichum cimbicis* and *T. gammae*, with a few identified as belonging in the Deuteromycete class. Mycelial forms were encountered infrequently. The significance of these fungi in the control of thrips remains to be ascertained once their pathogenicity and virulence are determined. Figures 5; tables 1; references 4: 3 Russian, 1 Western.

12172/5915  
CSO: 1840/2254

UDC 581.143.6:633.18

#### REPRODUCTION OF NONGERMINATING RICE SEEDS BY TISSUE CULTURE TECHNIQUES

Moscow SELSKOKHOZYAYSTVENNAYA BIOLOGIYA in Russian No 4, Apr 86  
(manuscript received 28 Nov 85) pp 14-17

[Article by L. A. Kucherenko, All-Union Scientific Research Institute of Rice, Krasnodar]

[Abstract] Experiments were conducted with rice (*Oryza sativa*) that had been stored for 4 or more years without special precautions to define tissue culture techniques which would favor reproduction of nongerminating seeds. Following sterilization with chemicals and washing, the seeds were cultivated on solid media with various concentrations of 2,4-D to induce callus formation, and for plant regeneration the callus was cultured without 2,4-D but with either kinetin or indoleacetic acid. Seeds with low germination potential (4-13%) under laboratory conditions showed an increase to a germination rate of 31-62% following such manipulation. However, the in vitro techniques were unsuccessful with seeds that had completely lost the ability to germinate as a result of prolonged storage. A transitional stage appears to exist between reduced germinative potential and complete loss of viability, in which it is possible to induce undifferentiated tissue growth (callusogenesis). Such techniques, relying on the induction of callus growth from which a plant can be regenerated, can be used to recover seemingly lost specimens. Figures 1; references 11: 5 Russian, 6 Western.

12172/5915  
CSO: 1840/2269

## AGROCHEMICAL EVALUATION OF SOFT AND HARD SPRING WHEAT VARIETIES

Moscow SELSKOKHOZYAYSTVENNAYA BIOLOGIYA in Russian No 4, Apr 86  
(manuscript received 10 Nov 85) pp 55-59

[Article by V. S. Golik, P. P. Berezhnuy, Yu. A. Polesko, A. M. Sleptsov, P. P. Vlasenko and Z. A. Buryak, Ukrainian Scientific Research Institute of Plant Culture, Breeding and Genetics imeni V. L. Yuryev, Kharkov]

[Abstract] An analysis was conducted on the agrochemical indicators of hard and soft wheat in terms of N, P and K uptake in the forest-steppe region of Ukraine. Tabular data on the relationship between harvest and total NPK uptake from the soil and uptake of the individual elements demonstrated that there was a significant positive correlation between total NPK uptake and grain yield ( $r = 0.74$ ) for the soft wheat. The relationship was also high for nitrogen ( $r = 0.85$ ), but there was no significant correlation between grain yield and potassium or phosphorus. For hard wheat the correlation was high for both total NPK ( $r = 0.96$ ) and for the individual elements ( $r = 0.88-0.97$ ). The demonstration that NPK status is an important factor in wheat selection, which is indicative of efficiency in utilization and assimilation of nutrient elements, provides a new basis for planning harvests in relation to wheat variety, fertilization, and soil and climatic conditions. Tables 3; references: 13 (Russian).

12172/5915  
CSO: 1840/2269

UDC 631.821.86

## LIME-DEPENDENT EFFECTS OF FERTILIZERS ON CROP HARVESTS IN ROTATIONS IN ZHITOMIR FOREST REGION

Kiev VISNYK SILSKOHOSPODARSKOYI NAUKY in Ukrainian No 4, Apr 86  
(manuscript received in final form 4 Mar 85) pp 46-48

[Article by D. L. Chernyy, candidate of agricultural sciences, Scientific Research Institute of Agriculture of the Nonchernozem Zone of the Ukrainian SSR]

[Abstract] Comparative harvest data were analyzed for the period 1969-1979 to determine the relative effectiveness of cattle manure and mineral fertilizers in relation to liming in the Zhitomir Polesye region (low-lying forest area). Without liming, cattle manure yielded better harvests of potatoes, corn, lupine, oats, winter rye, clover, and flax than obtained with the use of mineral fertilizers on the acidic soil, with the reverse relationship applicable to winter wheat. Liming diminished the advantage of manure over the mineral fertilizers, which improved the harvests of all the crops in the study with the exception of lupine. Tabular data are presented on the gains in harvest with the various combinations of fertilizers with and without liming, demonstrating



the effectiveness of the latter. The combination of fertilizers and liming also resulted in enhanced crop quality, as measured by starch and ascorbic acid levels in potatoes, and protein levels in the other crops. Tables 3.

12172/5915  
CSO: 1840/2260

#### BREEDING COTTON FOR IMMUNITY

Moscow SELSKAYA ZHIZN in Russian 27 Apr 86 p 2

[Article by A. Kasyanenko, doctor of biological sciences, laboratory chief, Department of General Genetics of Cotton, Tajik SSR Academy of Sciences, Dushanbe]

[Abstract] Extensive experience has shown that success in breeding wilt-resistant cotton can come only from a close cooperation among breeding experts, geneticists, microbiologists and plant protection experts. However, such close cooperation is at present lacking at too many research centers, leading to duplication of efforts and short-term success, if any. And yet, considerable success has been achieved by creating hybrids from Soviet and foreign varieties, and by alternating varieties that differ in their susceptibility to the prevalent phytopathogen. Such techniques limit the need for chemical pest control, which is a special factor in cotton farming that is so heavily dependent on chemicals for pest control. The time is now ripe to modernize the approach to cotton breeding by utilizing the expertise of allied specialists, and for ensuring that such collaborative efforts have full material and financial support.

12172/5915  
CSO: 1840/1217

UDC 631.528 + 633.511

#### MUTAGENIC ACTIVITY OF PESTICIDES USED IN CULTIVATION OF COTTON

Ashkhabad IZVESTIYA AKADEMII NAUK TURKMENSKOY SSR: SERIYA BIOLOGICHESKIKH NAUK in Russian No 6, Nov-Dec 85 (manuscript received 25 Apr 85) pp 14-19

[Article by K. Mamedov, B. Yu. Rustamova and N. N. Shamayeva, Botanical Institute, TSSR Academy of Sciences]

[Abstract] Genetic effect of pesticides on fine fiber cotton was evaluated, concentrating on three agents: Bi-58 (o,o-dimethyl-S(N-methylcarboylmethyl)-diethyl phosphate), TMTD (tetramethylthiuram disulfide) and HCCH (hexachlorocyclohexane). All of them extended the vegetation period of cotton plants in a wide range of doses and expositions: the plants grew taller but their productivity remained at the same level, or actually decreased. Economically important indices were adversely affected by these pesticides: mass of single seed

capsule fiber length and its total yield. The number of cells with chromosomal aberrations increased with increasing dose of the pesticides. Various brands of the cotton responded in different ways to these pesticides, hence individual evaluation was recommended; these plants could be used as test objects in mutagenic evaluation of pesticides. Due to the fact that Bi-58, TMTD and HCCH exhibited mutagenic activity, they should be handled with care. Genetically safe dosages should be established. References 7: 5 Russian, 2 Western.

7813/5915  
CSO: 1840/2218

UDC 588.288:633.51:575.4

#### FUSARIUM LK EX FR FUNGI ISOLATED FROM COTTON OF TASHAUZ OBLAST

Ashkhabad IZVESTIYA AKADEMII NAUK TURKMENSKOY SSR: SERIYA BIOLOGICHESKIKH NAUK in Russian No 6, Nov-Dec 85 (manuscript received 20 Feb 84) pp 60-61

[Article by A. A. Kerbabayeva and I. P. Frolov, Botanical Institute, TSSR Academy of Sciences]

[Abstract] Tashauz oasis differs from other Turkmenistan regions: it is completely included in Karakum northern agroclimatic region. The microflora of this territory was poorly studied until 1980-83. Data are presented on endophytic fungi isolated from 500 diseased cotton specimens. Eleven species and varieties of *Fusarium* fungi were isolated; their origin and spread in the study area is reported. References 3 (Russian).

7813/5915  
CSO: 1840/2218

UDC 632.4

#### SOME BIOLOGICAL CHARACTERISTICS OF MOST DESTRUCTIVE FUNGI FOUND ON FRUITS AND VEGETABLES DURING EXTENDED STORAGE IN TURKMENISTAN

Ashkhabad IZVESTIYA AKADEMII NAUK TURKMENSKOY SSR: SERIYA BIOLOGICHESKIKH NAUK in Russian No 6, Nov-Dec 85 (manuscript received 20 Feb 84) pp 68-70

[Article by A. A. Kerbabayeva and I. P. Frolov, Botanical Institute, TSSR Academy of Sciences]

[Abstract] The most destructive fungi affecting long term storage of fruits and vegetables are: *Penicillium clavigerum* Demelius, *P. cyclopium* Westl. and *P. expansum* Link (for apples); *P. italicum* Wehmer, *P. digitalum* Sacc. (for citrus fruit); *Trichothecium roseum* Link (for quince); *Fusarium gibbosum* App. et Wr. emedn. Bilai, *F. sambucicum* Fusk, *F. Expansum* Schlecht, *F. moniliforme* Sheld, *F. solani* App et Wr. (for potatoes); *Aspergillus niger* von Tiegh (for

onions) and *Botrytis cinerea* Pers. (for carrots). The effect of temperature and humidity on their growth is evaluated; both should be controlled carefully as some of the fungi do not reproduce at low temperatures, others reproduce poorly. Effect of most of the fungi are very specific, so that storage of several types of fruits and vegetables at the same place is acceptable. Special attention should be paid to monitoring *Penicillium*, *Spergillus* and *Fusarium* fungi. References 6 (Russian).

7813/5915

CSO: 1840/2218

## BIOCHEMISTRY

### MICROORGANISM DISINTEGRATORS FOR BIOCHEMISTRY AND PHARMACEUTICS

Moscow LENINSKOYE ZNAMYA in Russian 14 Jun 86 p 4

[Article by N. Yakunina]

[Excerpt] "Would you think that the membranes of microbes are strong, or not so strong?" Professor B. A. Fikhte, head of a laboratory of the USSR Academy of Sciences' Institute of Biochemistry and Physiology of Microorganisms [in Pushchino], posed this strange question. Why would the 'clothing' of such tiny creatures be especially strong?

"Its strength is nevertheless close to that of steel!" was the professor's answer.

Ways of opening up this membrane had to be found, because the microbial cell contains very valuable components beneath the membrane. These substances are indispensable in biochemistry and medicine, the food industry and agriculture... The problem is to remove them from under the membranes without harming them.

This work was not only complex but very important, which was why Academician G. K. Skryabin, director of the institute, personally supervised it.

The scientists studied the mechanical properties of microbial cells and realized that equipment which present-day instrument and machine building has to offer would be of no help. They themselves had to design new apparatus. Physicists, biophysicists, microbiologists and biochemists all took part in the project.

A disintegrator was developed. It is a kind of mill for microorganisms. It takes its name from the concept of 'disintegration'--the grinding-up or breaking-down of something.

Many prototypes of devices were developed and tested in collaboration with engineers of a special design bureau of biological-instrument building which is located a short distance from the institute. Associates of the Noginsk branch of the USSR Academy of Sciences' Institute of Chemical Physics and of other organizations joined in the work, as did foreign colleagues. The result of this joint creative undertaking is a large complex of disintegrator devices.

It was first necessary to formulate theoretical principles for development of the apparatus, using modern methods of systems analysis, chemical cybernetics, and mathematical modeling.

The apparatus which the Pushchino scientists and engineers developed differs markedly from known counterparts. The primary difference is its so-called focused nature, i.e., highly precise organization of complex processes; this effect had not been achieved before.

The disintegrators can do many things. They will make it possible to obtain cellular structures in practically their original state. They will raise the standard of materials for new fields of biochemistry and biophysics.

The following example illustrates the capabilities of the new technology. A process for obtaining a number of biologically active substances from microbial cells was developed at the institute, and mechanical disintegration makes it 10 times less expensive. A method of obtaining yeast cytochrome C (a valuable biochemical reagent and at the same time a promising medical preparation) which was developed on the basis of disintegration has already been introduced in the economy.

In the institute's office of microorganism disintegration, Candidate of Biological Sciences V. M. Ushakov and senior engineer G. A. Gurevich showed me many 'mills for microbes.' There are more than 20 types of mills in the complex. One of them--a small microorganism disintegrator, the "ML-1"--was awarded a gold medal of the International Exhibition and Fair "Leipzig-84".

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CSO: 1840/1255-E

UDC (581.5226.325:574.583:556.531.4)(0.8628)

FLUOROMETRIC DETERMINATION OF CHLOROPHYLL A AND PHEOPHYTIN IN PHYTOPLANKTON

Kiev GIDROBIOLOGICHESKIY ZHURNAL in Russian Vol 22, No 2, Jan-Feb 86  
(manuscript received 25 May 82) pp 89-95

[Article by O. A. Yunev and G. P. Berseneva, Institute of Biology of Southern Seas, Ukrainian SSR Academy of Sciences, Sevastopol]

[Abstract] Discussion is presented of several problematic areas of determination of the concentration of chlorophyll a and pheophytin by a fluorometric method, using a modification of conventional FEK-56 fluorimeter. The mathematical equations were derived to yield linear plots up to a concentration of 1 µg/ml chlorophyll for diluted acetone extract of phytoplankton. The ideal analytic conditions were created by extraction with 90% acetone and acidification with 1-2 drops of 1 N HCl to give a sample with a pH of 2-3. However, field trials demonstrated that often significant quantities of chlorophyllide a and allomerized forms of chlorophyll are present. Since their absorption and fluorescence characteristics are identical to those of chlorophyll a, additional chromatographic methods would be required for their removal. These observations demonstrate that, despite the high sensitivity of the fluorometric method, it suffers from interference by chlorophylls b and c in the determination of chlorophyll a and pheophytin a. These facts indicate that further refinements will have to be introduced to make this method suitable for routine determinations. Figures 3; references 21: 6 Russian, 15 Western.

12172/5915

CSO: 1840/2249

CONTINUOUS MONITORING OF ACTIVE PHYTOPLANKTON IN WATER BODIES BY MEANS OF  
DELAYED FLUORESCENCE

Kiev GIDROBIOLOGICHESKIY ZHURNAL in Russian Vol 22, No 2, Jan-Feb 86  
(manuscript received 26 Nov 84) pp 87-89

[Article by D. N. Matorin, I. R. Vasilyev, P. S. Venediktov and S. P. Zakharkov,  
Moscow State University]

[Abstract] Cursory details are presented on the use of delayed fluorescence in the monitoring of phytoplankton by means of a phosphorescopic device. This monitoring technique for microscopic algae, which is based on measuring recombination reactions of photooxidized and photoreduced electron carriers, reflects the concentration of active reactive centers in the photosynthetic apparatus. Correlation coefficients between the results obtained by measuring the intensity of delayed fluorescence and C-14 uptake have generally been in the 0.7 to 0.9 range, with a sensitivity for the fluorescent method of at least 0.01 to 0.05 µg/liter. Problems inherent in the delayed fluorescence technique come from luminescence of the quartz flow-through cuvette and light scatter by several components of the system. The method, however, lends itself to continuous monitoring studies. Figures 1; references 11: 8 Russian, 3 Western.

12172/5915  
CSO: 1840/2249

## BIOTECHNOLOGY

### ROLE OF BIOTECHNOLOGY IN VACCINES AGENCY

Moscow MEDITSINSKAYA GAZETA in Russian No 44, 30 May 86 p 4

[Text] For the purpose of expanding and intensifying scientific research work in applied immunology, biotechnology, and cellular and genetic engineering, and of developing and producing immunobiological preparations, vaccines, immunoglobulins, immunomodulators, blood preparations, allergens, nutrient media, diagnostic preparations and a number of other preparations, the Main Administration for Production of Bacterial and Viral Preparations of the USSR Ministry of Health (Minzdrav) has been renamed the Main Administration of Medical Biotechnology and Immunopreparations of USSR Minzdrav.

FTD/SNAP

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CSO: 1840/1253-E



## PRACTICAL GAINS FROM RESEARCH

Moscow EKONOMICHESKAYA GAZETA in Russian No 26, Jun 86 p 15

[Article by R. Kukayn, academician, director of the Institute of Microbiology, Latvian SSR Academy of Sciences]

[Abstract] In order to make practical use of research conducted at the various scientific establishments, there is need for close cooperation between scientists and technologists. To that end, special measures have to be taken to bring these two branches of the economy closer together to assure an efficient transfer of knowledge. Many of the discoveries and achievements at the Institute of Microbiology have found practical applications both in energy production from biomass and in new lines of diagnostic reagents. However, more often than not, there was an unnecessary long delay in seeing practical applications of research endeavors because of bureaucratic delays and formalities. Comrade M. S. Gorbachev has proposed that scientific-industrial associations be formed at the oblast and, even, the rayon levels. This is a positive development in the more rapid practical implementation of research results, and Comrade Gorbachev's ideas will serve as a catalyst for the further development of the Soviet economy.

12172/5915

CSO: 1840/1214

## EPIDEMIOLOGY

### DISCOVERY OF SELF-REGULATION OF EPIDEMICS

Moscow MEDITSINSKAYA GAZETA in Russian No 42, 23 May 86 p 3

[Article by R. Akhmetov, correspondent]

[Abstract] The article provides comments on the nature and significance of the discovery of internal regulation of the epidemic process, a discovery which was entered in the USSR State Register of Discoveries on May 22. The scientists who discovered this phenomenon are said to be affiliated with the Military Medical Academy imeni Kirov. They are V. D. Belyakov, member of the USSR Academy of Medical Sciences; Professor K. G. Ivanov; Doctor of Medical Sciences A. A. Selivanov; and candidates of medical sciences P. V. Ostroumov and A. P. Khodyrev.

Belyakov related that the research began with studies of the behavior of micro-organisms during periods between the epidemics which they cause. It was found that they remain in a weakened state in organisms which have acquired immunity to them, until this immunity is lost. Then they become stronger and begin to multiply. The aggressiveness of pathogens was found to vary also depending on the living conditions of their hosts and the availability of nutrient materials.

The findings reportedly have led to the discovery of precursor phenomena of epidemics and to radical changes in strategy and tactics for preventing and combating infections. Diversification of the forms of pathogens and an increase in the antibodies of host-organisms have been found to occur shortly before influenza epidemics, for example. New possibilities have opened up for eliminating infections, individualizing disease prevention, and identifying high-risk territories, groups, times and factors in epidemics, it is claimed.

F'TD/SNAP

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CSO: 1840/1254-E

## CLINICAL-EPIDEMIOLOGIC CHARACTERISTICS OF BOTULISM

Kiev VRACHEBNOYE DELO in Russian No 8, Aug 85 (manuscript received 29 May 84)  
pp 118-120

[Article by V. T. Shugaylo, S. M. Dorofeyev, A. V. Baklanova and L. G. Yurova,  
Department of Infectious Diseases (Chairman: Professor V. T. Shugaylo) of the  
Therapy Faculty at Voroshilovgrad Medical Institute]

[Abstract] Clinical-epidemiological analysis was reported of sporadic cases of botulism observed on 57 patients aged 3 to 65 years (25 males and 32 females). The cases were traced back to consumption of canned mushrooms, sun-cured fish, canned fruit and pork fat, all of domestic production. Clinical symptoms included skin pallor, mouth and throat dryness, dizziness, nausea, stomach ache, constipation, etc. Along with dyspeptic symptoms, CNS problems were noted. The most serious clinical symptoms included development of the bulbar syndrome: difficulty in swallowing and respiratory problems. The complications included pneumonia, neuritis, myocarditis and acute respiratory insufficiency. Recovery was slow. Treatment included removal of the toxin, antitoxin serum and in select cases hormonal therapy and hyperbaric oxidation.

7813/5915  
CSO: 1840/2222

MUTAGENIC ACTIVITY OF CARCINOGENS AND OTHER CHEMICALS IN SALMONELLA  
TYPHIMURIUM TESTS

Leningrad VOPROSY ONKOLOGII in Russian Vol 32, No 3, Mar 86  
(manuscript received 24 Dec 84) pp 73-80

[Article by V. V. Khudoley, I. V. Mizgirev and G. B. Pliss, Order of the Red  
Banner of Labor Scientific Research Institute of Oncology imeni N. N. Petrov,  
USSR Ministry of Health, Leningrad]

[Abstract] The Ames Salmonella typhimurium/hepatic microsome mutagenicity test was employed to screen 106 chemical compounds, divided into known carcinogens, noncarcinogens, and agents with uncertain carcinogenicity status. Metabolic activation studies involved the S<sub>9</sub> liver fraction obtained from Aroclor-1254-treated rats. The resultant findings demonstrated that the sensitivity of the test was 88.2% and specificity 81.5%, with an overall predictive index of 90%. Of particular importance was the fact that among 28 agents in the uncertain category that are extensively used in the food and pharmaceutical industries, the following were identified as mutagenic: 1-aminoanthraquinone, 2-aminoanthraquinone, 1-amino-4-chloroanthraquinone, basic blue dye, dinitrochlorobenzene, nitrosodiphenylamine and 2,3,5-trinitronaphthalene. References 24: 3 Russian, 21 Western.

12172/5915  
CSO: 1840/2228

HELIOBIOLOGIC ASPECTS OF PROGNOSTICATING EPIZOOTIC PLAGUE IN NATURAL FOCI OF TURKMENISTAN

Ashkhabad IZVESTIYA AKADEMII NAUK TURKMENSKOY SSR: SERIYA BIOLOGICHESKIKH NAUK in Russian No 6, Nov-Dec 85 (manuscript received 25 Apr 84) pp 61-63

[Article by N. V. Popov, V. P. Sosnovtseva, I. V. Zhernovov (deceased) and V. P. Kozakevich, All Union Scientific Antiplague Research Institute "Mikrob", TSSR Antiplague Station]

[Abstract] Gerbil reproduction was analyzed in terms of solar cycles. The sun activity phases (11, 22 and longer cycles) appear to be the regulating mechanism for the reproduction intensity of gerbils and their own 5-6 year cycles. They could be used in predicting the epizootic waves of the spread of plague in the territories studied. Due to the fact that the cycle rodent-flea-rodent has not yet been adequately studied, local microepizootic flares could not be properly predicted. But on a larger scale, on the basis of this hypothesis two epidemics of plague in Turkmenistan are predicted during 1986-88 and 1995-98 periods. Figures 2; references 4 (Russian).

7813/5915  
CSO: 1840/2218

BLOCK FORMATION ABILITY OF PLAGUE-INFECTED FLEAS FED WITH BLOOD SUBSTITUTES

Leningrad PARAZITOLOGIYA in Russian Vol 19, No 3, May-Jun 86 (manuscript received 21 Nov 83) pp 242-244

[Article by A. K. Akiyev, A. P. Beyyer and V. A. Popov, Scientific Antiplague Research Institute of Caucasus and Transcaucasus, Stavropol]

[Abstract] It has been hypothesized in the past that plague microbes can utilize blood heme in forming blocks. This hypothesis was tested by examining block formation in plague-infected fleas fed a mixture of blood substitutes and dry hemoglobin. The tests showed that the number of blocked fleas fed on blood substitutes containing no formed blood elements was somewhat lower than that of fleas fed on a healthy mouse. In some cases blocks were seen in fleas fed with pure blood substitutes; this observation needs further evaluation. These fleas were capable of infecting and eventually killing white mice. References 8: 6 Russian, 2 Western.

7813/5915  
CSO: 1840/2263

# ANAEROBIC CLOSTRIDIAL INFECTIONS OF SURGICAL WOUNDS

Moscow KHIRURGIYA in Russian No 5, May 85 (manuscript received 7 May 84)  
pp 110-112

[Article by L. I. Lipskiy, candidate of medical sciences, V. V. Drozdov, V. S. Khomyakova, V. V. Yadrikhinskiy and V. M. Kuznetsova, Elective Surgery Clinic, Arkhangelsk Medical Institute; No 7 Clinical Hospital]

[Abstract] Three cases of postsurgical gas gangrene are discussed, with emphasis placed on early recognition as a key factor in patient survival. Two of the cases involved surgery on abdominal organs, and one involved resection of a pararectal fistula. The clinical presentation of the infectious complication was a classical nature, with early surgical intervention involving extensive resections felt to be a key factor in successful therapy. These cases call to mind the need for constant alertness to the possibility of clostridial myonecrosis, particularly when operating on abdominal and pelvic organs. Treatment should be resolute with extensive debridement and removal of all devitalized tissues, in combination with antibacterial chemotherapy and detoxification. References 6 (Russian).

12172/5915  
CSO: 1840/2210

# CHIMKENT MUNICIPAL DISINFECTION STATION--EXAMPLE TO BE FOLLOWED

Alma-Ata ZDRAVOOKHRANENIYE KAZAKHSTANA in Russian No 4, Apr 86 pp 14-15

[Article by A. G. Alzhanov, S. Zh. Bimanov, V. D. Davilman and A. I. Sultanbekov, Kazakh SSR Ministry of Health; Chimkent Municipal Disinfection Station]

[Abstract] The Chimkent Municipal Disinfection Station (CMDS) has been shown to be one of the most efficient operations of its kind in the USSR, and has been recognized for its innovative approaches to disinfection and pest control since 1975. Rodent control remains one of the key areas of activity of CMDS, and the effectiveness of the staff and its approach to the problem is evident in the fact that 96.7% of the area in its sphere of responsibility is now rodent-free. This includes all of the medical facilities in the area. The CMDS is also engaged in public health education and in the training of specialists, as well as in offering assistance and supplemental training to other similar institutions. Many of the staff at CMDS have been recognized for their efforts by special awards, which serves as a further stimulus to dedication and continuing professional commitment.

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CSO: 1840/2233

## GENETICS

### SYMPOSIUM ON GENETIC ENGINEERING IN NEUROPEPTIDE R&D

Moscow MEDITSINSKAYA GAZETA in Russian No 41, 19 May 86 p 3

[Article by V. Likholtov and I. Neklyudov, correspondents]

[Abstract] The article summarizes proceedings of the international symposium "Neuronal Receptors, Endogenous Ligands and Biotechnological Approaches", which took place recently in Moscow. A report given by neurobiologists of the All-Union Mental Health Research Center of the USSR Academy of Medical Sciences (AMN SSSR) and chemists of the USSR Academy of Sciences' Siberian Department was said to be one of the main events of the symposium. This report dealt with genetic-engineering methods these scientists have developed for producing neuropeptides of the endogenous-ligand type. M. Ye. Vartanyan, corresponding member of AMN SSSR and deputy director of the mental health center, Academician P. G. Kostyuk, and a number of foreign participants are quoted in regard to results of the symposium, pharmacological applications of research in the field of medical genetics, and prospects for the further advancement of this kind of work.

FTD/SNAP

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CSO: 1840/1254-E

## IMMUNOLOGY

### CONTROL OF INFLUENZA

Odessa TASS in English 9 Jun 86

[Excerpts] The USSR pharmaceutical industry has begun production of anti-flu vaccines on the basis of an influenza virus of enhanced immune activity. The strain of this virus has been obtained for the first time in world practice in the laboratory of viral genetics of the Virology and Scientific Research Institute in Odessa (Ukraine). This major Soviet bacteriological center is 100 years old today.

The Institute in Odessa, its director said, at the present time carries out the functions of focal base of the All-Union Center on Influenza and Chlamydiasis. Research has been carried out successfully for a number of years in its laboratories specializing in the epidemiology of influenza in conditions of a large town. On the basis of this research an integrated system of measures has been developed on the prevention of this dangerous illness and it is being widely introduced into medical practice in our country. The institute's work in this direction has become part of the program of international cooperation of CMEA members on the problem of "flu".

/5915

CSO: 1840/1248-E

EFFECTS OF PROTECTIVE STAPHYLOCOCCAL SOMATIC ANTIGEN ON LIPID METABOLISM AND  
TISSUE RESPIRATION

Alma-Ata ZDRAVOOKHRANENIYE KAZAKHSTANA in Russian No 4, Apr 86 pp 57-59

[Article by R. D. Asanbayev, Ye. K. Averyanova, Kh. Sh. Kuzhantayeva and  
Ye. A. Podyacheva, Chair of Biochemistry, Alma-Ata Medical Institute]

[Abstract] In view of the extensive physiological effects of staphylococcal protective somatic antigen (protein A ?), studies were conducted on chinchilla rabbits on its effects on lipid metabolism and tissue respiration following subcutaneous administration. Within 6 h of administration (80 mg/kg) Krebs cycle dehydrogenase activities were depressed in all the tissues by 28-50%, particularly so in the liver and kidneys, while serum levels of beta-lipo-proteins, UFA and total cholesterol were increased by 25-34%. Cholesterol esters, however, were depressed by 19%. After 12 days (following 2 injections of the antigen) a number of the biochemical indicators returned to baseline values, while total cholesterol was decreased by 16%. Krebs cycle dehydrogenases showed elevated activities, especially in the heart and liver. These observations indicate that immunization with the protective antigen induced transient metabolic changes which, nevertheless, can be used to monitor the reactivity and safety of antigenic preparations obtained from staphylococci. References 3 (Russian).

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UDC 616.124.7-001-092.9-02:615.849.19

EXPERIMENTAL INDUCTION OF COMPLETE A-V BLOCK WITH LASER ENDOSCOPIC SURGERY

Moscow BYULLETEN EKSPERIMENTALNOY BIOLOGII I MEDITSINY in Russian No 4,  
Apr 86 (manuscript received 11 Oct 85) pp 504-507

[Article by M. Ye. Sargin, V. F. Portnoy, N. D. Skuba, S. S. Grigorov and  
A. D. Arapov, Institute of Surgery imeni A. V. Vishnevskiy, USSR Academy of  
Medical Sciences, Moscow]

[Abstract] Experimental trials were conducted on the induction of complete A-V block in 18 perfused canine hearts, using a Ne:YAG laser with fiberoptic endoscopic delivery of light pulses. Stable blocks were obtained with energies in the 83-131 J range, generally after 3-4 pulses with a 3-4 mm spot irradiation. Histologic studies demonstrated that the zone of destruction penetrated to a depth of 0.9-1.3 mm. This study demonstrated that complete A-V blocks can be obtained with a Ne:YAG laser system under the experimental conditions employed, suggesting the potential use of this approach in the treatment of clinical cases. Follow-up studies will be conducted to determine the long-term persistence of such blocks. Figures 2; references 14: 6 Russian, 8 Western.

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CSO: 1840/2242

UDC 616.22-089-053.2:615.849.19

ENDOLARYNGEAL LASER MICROSURGERY IN CHILDREN

Kiev ZHURNAL USHNYKH, NOSOVYKH I GORLOVYKH BOLEZNEY in Russian No 4,  
Jul-Aug 85 (manuscript received 20 Nov 84) pp 45-49

[Article by D. G. Chireskin, A. M. Dunayevskaya and V. I. Gurkin, Department  
of Restorative Pediatric Laryngeal and Tracheal Surgery, No 2 Pediatric Order  
of the Red Banner of Labor Hospital imeni I. V. Rusakov]

[Abstract] Clinical trials were conducted with the use of coherent CO<sub>2</sub>-400  
helium-neon laser in the management of various laryngeal conditions of 27  
pediatric patients. The patients, 1 to 14 years old, were treated for stenosis

due to scar-tissue formation, papillomatosis, and nodose formations. While the effects were variable and in some cases required repeat procedures, best results were obtained with 0.2, 0.5 or 1 sec pulses with a power output of 25-30 W. The postoperative course was generally smooth and uneventful. The preliminary clinical impression was that this modality has a definite place in the treatment of children with laryngeal problems, and offers a number of obvious advantages over the use of microinstrumentation. The long-term effect will have to be evaluated after due follow-up period. References 11: 7 Russian, 4 Western.

12172/5915  
CSO: 1840/2234

UDC 616.31-06:615.849.19:616-092.9

OXYGEN TENSION OF ORAL MUCOSA OF EXPERIMENTAL ANIMALS AFTER TREATMENT WITH HELIUM-NEON LASER

Kiev ZHURNAL USHNYKH, NOSOVYKH I GORLOVYKH BOLEZNEY in Russian No 4, Jul-Aug 85 (manuscript received 21 Nov 84) p 65

[Article by G. A. Karas, A. A. Ivashkevich and I. F. Sokolyanskiy, Biophysics Laboratory and Department of Medical Information, Kiev Scientific Research Institute of Otolaryngology imeni A. I. Kolomiychenko]

[Abstract] The effects of helium-neon laser irradiation (0.63  $\mu$ m, 0.10-0.11 W/cm<sup>2</sup>, 1-60 min) of the oral mucosa in outbred white rats were evaluated in terms of mucosal oxygen tension. The polarographic studies showed that pO<sub>2</sub> increased in direct proportion to the duration of exposure. The levels remained elevated for ca. 1 h after exposure, and thereafter decreased to baseline levels.

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UDC 615.849.19.038

COMBINED MAGNETIC-LASER THERAPY OF PERIODONTAL DISEASES

Alma-Ata ZDRAVOOKHRANENIYE KAZAKHSTANA in Russian No 4, Apr 86 pp 47-50

[Article by L. Ya. Zazulevskaya, G. V. Kogan and A. K. Polonskiy, Chair of Therapeutic Stomatology, Alma-Ata Medical Institute]

[Abstract] Therapeutic trials were conducted on 98 patients with periodontal diseases to evaluate the relative merits of combined magnetic-laser therapy and magnetic therapy as the sole modality. Optimal objective and subjective results were obtained with the combined therapy used in the following regimen:

application of a ferrite magnetic ring with an induction of 25-30 mT in combination with helium-neon laser irradiation ( $60 \text{ mW/cm}^2$ ) of 10 fields, with 30-40 sec/field. The entire course of therapy consisted of 10 daily procedures. Concomitant IR spectroscopy of the dry residue of saliva demonstrated that clinical improvement was accompanied by structural changes in the components of the saliva. The latter changes were related to a reduction in the levels of phosphatides and nucleotides, and in the transition of the  $\text{O}=\text{C}=\text{N}$  groups in the protein molecules from the trans- to the cis-form. The combined therapy apparently induced a reorientation of diamagnetic protein molecules, and appears to constitute a promising addition to the therapeutic armamentarium. Figures 2; references 10 (Russian).

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CSO: 1840/2233

UDC 613.645:621.375.826]-07:612.843.142:612.6.03

#### EFFECTS OF LOW-ENERGY LASER IRRADIATION ON RHODOPSIN RATE OF REGENERATION IN RABBIT RETINA

Moscow GIGIYENA TRUDA I PROFESSIONALNYYE ZABOLEVANIYA in Russian No 11, Nov 85 (manuscript received 21 Aug 84) pp 43-44

[Article by N. A. Machkova, I. N. Ushkova and A. L. Berman, Institute of Labor Hygiene and Occupational Diseases; Institute of Evolutionary Physiology and Biochemistry imeni I. M. Sechenov, USSR Academy of Sciences, Leningrad]

[Abstract] The effects of low-energy helium-neon laser emission on the status of rhodopsin was investigated on rabbit retinas, employing LG-38 laser with emission at  $0.6328 \mu\text{m}$ . With a defocused beam covering an area  $700 \mu\text{m}$  in diameter and an energy output of  $9.3 \times 10^{-2} \text{ J}\cdot\text{cm}^{-2}$  no change in rhodopsin content occurred with an irradiation time of 14 min. However, with an increase in the diameter of the irradiated retinal spot to  $5700 \mu\text{m}$ , a 12.4% reduction in the concentration of rhodopsin was obtained after 25 min of irradiation. Subsequent recovery in the dark required 3 h for the rhodopsin level to regain baseline value. These observations demonstrated that a laser emitting at  $0.6328 \mu\text{m}$  has minimal effects on the level of rhodopsin in the rabbit retina, and that the decrease in the rate of regeneration is most probably due to the effect of the red light on the pigmented cells. References 12: 7 Russian, 5 Western.

12172/5915  
CSO: 1840/2204

DESTRUCTION OF ATHEROSCLEROTIC LESIONS OF HUMAN CADAVER ARTERIES BY  
IRRADIATION WITH COPPER VAPOR LASER

Moscow KHIRURGIYA in Russian No 5, May 86 (manuscript received 7 Feb 86)  
pp 112-116

[Article by B. V. Petrovskiy and N. D. Devyatkov, academician, I. Kh. Rabkin, professor, I. V. Maksimovich and K. A. Rogov, candidates of medical sciences, V. S. Aleynikov, V. P. Belyayev, L. D. Mamedli and V. I. Masychev, All-Union Scientific Center of Surgery (Director: Academician B. V. Petrovskiy) Moscow]

[Abstract] Laser scanning was applied over atherosclerotic lesions obtained from freshly deceased individuals. Experiments were performed on 96 fragments of various vessels (aorta, iliac artery, femoral artery, etc). After laser treatment, the material was fixed in formalin and imbedded in paraffin; the slides were then stained. Histological analysis showed that disappearance of the lesion bulging corresponded to disappearance of atheromatous material from the tissue. The structure of the vessel walls did not change, hence this treatment appeared to be specific for atherosclerotic material. Depending on the stage of development, energies of 0.4-10.2 kJ per cm<sup>3</sup> of the material were needed to destroy the atherosclerotic lesions. The copper vapor laser beam appeared to be more affective than argon laser. Both photochemical and photoacoustic mechanisms may be involved in the process. This method was recommended for clinical trials. Figure 1; references 10: 8 Russian, 2 Western.

7813/5915  
CSO: 1840/2267

## MARINE MAMMALS

### DOLPHINARIUM TRAINER EXPERIENCE

Tbilisi MOLODEZH GRUZII in Russian 29 Apr 86 p 3

[Article by A. Yeremyan under the rubric "Nature and Us": "Hello, Dolphin!"]

[Text] ...Nobody called them. They came to the surface themselves and fixed their intelligent eyes on us. Krasavitsa, Lada and Malyshka, who was born in the Batumi Dolphinarium. Three likeable bottlenosed dolphins. I must confess, I rather envied Sergey Suglovov: working with amazing animals, about which so many legends have grown up, so many articles and books have been written and such a number of popular-scientific and artistic films have been made! I must admit, I even began to have doubts--is it worth writing about dolphins after all that? Sergey assured me that it was worth it--worth it because, in his opinion, it is so far impossible to study and understand them completely. He himself discovers something new, amazing and unusual in dolphins every day ....

The collective at the dolphinarium is small: trainers Georgiy Iosava, Gela Gedzhadze and Sergey Suglovov and microbiologist Tengiz Tserodze. They are people who love their work and are dedicated to it. Indeed, Sergey just told me that neither he nor his colleagues consider themselves to be trainers. This word, they say, is appropriate only to determine the staff unit. One can train a bear, a tiger, even an ostrich. A dolphin, though--one must simply associate with it, understand it and let it understand itself.

"Sergey, how did all this start?"

"It started when they built a dolphinarium in our city in 1974, and we began to work there. At that time there were still no manuals or special literature. Foreign oceanarium personnel kept all the fruits of their work secret. Thus we began, you might say, from zero. Man and dolphin. That was it. But even this was quite a bit. We caught the animals in the sea ourselves."

Sergey then told of a tragedy that had recently taken place: an epidemic had been carried into the tank from the sea and four dolphins perished. Krasavitsa, Lada and Malyshka are new settlers in the dolphinarium. Everything had to be started over again.

The animals who find themselves in the dolphinarium go through an adaptation period. It lasts three or four months, depending on the dolphin's nature. It is different in every dolphin. Then, when the dolphin is accustomed to the tank, and, most important--to man--the work begins. If a dolphin has taken a

fish from the trainer's hand, responded to call and swam to the platform--that means that it has agreed to get acquainted with man and perhaps even to make friends with him. The main thing is not to be captivated by nor to overwork the animal. Sometimes the dolphin itself suggests to the person how best to carry out a certain element of the routine. In so doing, the dolphin must display a good deal of "wave power" to perform certain feats. In the sea it does not usually have occasion to leap out of the water to a height of about five meters, but in a dolphinarium it accomplishes this with incredible adroitness.

Here is another such example. Even though the dolphin is a mammal, it always associates land with death. In the dolphinarium, however, it finds in itself the power to surmount this psychological barrier and, almost like a seal, gets completely out onto the platform.

In the program with which visitors to the Batumi Dolphinarium are becoming familiar these days, the dolphins perform about twenty different routines. These are synchronized leaping through hoops and over a crossbar, playing basketball, towing boats and a person and dancing to disco music. By the way, many of them prefer classical music. In the course of a single day about 3000 spectators become acquainted with these amazing animals. To the present day, a total of over 5 million persons has visited the Batumi Dolphinarium.

"Sergey, just why bottlenosed dolphins when, after all, there are two other types of dolphins living in the Black Sea?"

"The bottlenosed dolphin...one could talk about it endlessly. It is the largest and rarest Black Sea dolphin. Often, during sea excursions, holiday-makers can see animals following the ship. This is the white-sided dolphin, don't confuse it with the bottlenosed dolphin. If you are lucky, you can observe the white-sided dolphin even from the shore. The porpoise, or, as we still call it, the "Azovka" also lives in the Black Sea. The bottlenosed dolphin, though, is encountered less and less often, even though its capture for commercial purposes has long been prohibited. Thirty years ago these magnificent animals were still going about in schools of 80-100 head each. Now, however, you can sail the sea for a whole month and not encounter a single bottlenosed dolphin. Dolphins of all types have no natural enemies in the Black Sea. Even the white-sided dolphin, not to mention the bottlenosed, simply bite the Black Sea Crambe-shark in half. Disturbing marine ecology and polluting the water all contribute to diminishing the quantity of bottlenosed dolphins. The Black Sea bottlenosed dolphin has already appeared in the USSR Red Book. Most annoying of all is the fact that no work is being carried out to reestablish the population of these animals. After all, the bottlenosed dolphin is an intelligent dolphin. No, in no way do I want to disparage the intellectual capacities of other dolphins, for example, those same white-sided ones. It is simply that the bottlenosed dolphins are the most capable, the most reasonable, the most amazing ...."

All the qualities that Sergey enumerated may be related to many representatives of the family of toothed whales, but primarily to the bottlenosed dolphin, even though in many dolphinariums and oceanariums in the world there is already a good deal of experience in working with white-sided dolphins, pilot whales, white whales and killer whales. Sergey and his colleagues also have plans of their own in this respect. In the future they intend to prepare a program with

a mixed group of animals--bottlenosed and white-sided dolphins, even though the incompatibility of these two species is generally known. Romanian trainers have already succeeded in "making them friends" to a certain extent. Georgiy's, Gela's and Sergey's assistants during the attraction will be ... fur seals. Eared seals will be taught to serve balls and rings and will even take part, along with dolphins, in certain feats and routines. Two fur seals have already obtained a permanent "residence permit" in the Batumi Dolphinarium. A great deal of interesting work with them lies ahead.

But let us go back again to the dolphins. It is said that there are as many natures as there are people. The same thing can also be said of dolphins. Take, for example, Krasivitsa. It may happen that she does not perform some feat as she should, and this means she does not receive a reward in the form of a fish. No, she does not get it, so that she will recognize her error. She goes away to the bottom and sits there. She comes to the surface, takes air into her lungs--and goes down to the bottom again. For whole days she may not "talk to anyone." The trainer has to take the first step toward a peaceful settlement. One still doesn't know in advance whether Krasavitsa will accept it.

Now Lada is more tractable. She will make, for example, a "sloppy" leap, when she grazes the hoop with her body, so she will keep leaping until she performs the feat "perfectly." Then she gets the fish.

All the commands are given either by gesture or by whistle. The dolphins carry them out immediately. It sometimes happens, though, that the animals are in a stressful state. Sergey calls it being homesick for the sea. After all, no matter how large the tank is, no matter how deep--it is not the sea: it does not have the customary bottom, algae, crustaceans. Concrete walls, a concrete bottom, and fish are precisely according to schedule. There is no need to search and hunt for it. They serve it up, as they say, on a saucer. Therefore the colleagues at the dolphinarium decided to enclose, right in the sea, a large section in the area of Cape Pitsunda and to work with the animals there.

"We intend to carry out the outlined work in conjunction with the Marine Mammal Branch of the All-Union Scientific Research Institute of Marine Fishing and Oceanography," Sergey says. "But this is not the limit. I want to share a dream with you in parting.

There are no tanks and dolphinariums. There is only sea, man and dolphin. The man goes out to sea and calls the dolphin. It does not matter how--by supersonics, by a whistle. The calculated number of minutes pass--and on the surface of the sea appears the long-awaited fin. The dolphin swims up to the boat and leaps over it, thus inviting the man to be its guest, in its natural element. Then the man takes his aqualung and accepts the invitation. Now they are swimming side by side--man and dolphin. 'Hello, dolphin,' the man says to him."

12151

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UDC (574.64:599)(285.2)

AQUATIC MAMMALS AS INDICATORS OF WATER POLLUTION WITH ORGANOCHLORINE  
PESTICIDES AND POLYCHLORINATED BIPHENYLS

Kiev GIDROBIOLOGICHESKIY ZHURNAL in Russian Vol 22, No 2, Jan-Feb 86  
(manuscript received 26 Apr 83) pp 63-66

[Article by Ts. I. Bobovnikova, Ye. P. Virchenko, A. V. Dibtseva, A. V. Yablokov, G. N. Solntseva and D. V. Pastukhov, Institute of Experimental Meteorology, Obninsk; Institute of Developmental Biology imeni A. K. Koltsov, USSR Academy of Sciences, Moscow; Limnological Institute, Siberian Department, USSR Academy of Sciences, Listvenichnoye]

[Abstract] Chemical analyses were conducted on Lake Baikal seals to determine the body levels of DDT, its metabolites, various isomers of hexachlorocyclohexane (HCCH), and polychlorinated biphenyls (PCB) in relation to water pollution with these agents. Gas chromatographic analysis of the various organs and tissues revealed that the DDTs, HCCHs and PCBs were present in all the tissues. However, the highest concentrations of DDTs and PCBs were detected in the subcutaneous fat in both the adults and pups. The concentrations of the HCCH isomers in the various organs were 5- to 20-fold lower in comparison with that of DDT, due to the formers' greater solubility in water and, hence, smaller degree of accumulation in body fat. These observations demonstrate that the subcutaneous fat of seals can be used as an indicator of environmental pollution with organochlorines and PCBs and, therefore, used as a monitoring tool. References 12: 2 Russian, 10 Western.

12172/5915

CSO: 1840/2249



## MEDICINE

### INFRARED IMAGERS FOR INDUSTRY AND MEDICINE IN EXHIBITION

Riga SOVETSKAYA LATVIYA in Russian 20 May 86 p 2

[Text] Infrared imagers which enterprises of the optical-mechanics industry are showing in the "Machine Building" pavilion [of the USSR Exhibition of National Economic Achievements] are attracting the attention of many visitors. These devices have a wide range of employment. They can be used by geologists, foresters, electrical engineers, metalworkers and medical personnel.

The infrared imager "Rubin-2" is intended for recording thermal radiations of various objects. It is used in medicine as auxiliary equipment for detecting and diagnosing certain inflammatory processes, disorders of vessels, and impairments of blood circulation. This device is compact, and reliable in operation. Thermograms are issued in the form of recordings on special electrochemical paper. The infrared imager "Stator-1" is used to monitor quality of assembly and the condition of stators and turbine generators in the manufacturing, installation and repair of machinery.

Development of specialized "Infrared Imager--Computer" systems is in prospect. Specialists of the Azov Optical-Mechanical Plant have already developed such an infrared-imaging complex, the "Raduga-EVM". It is intended for computerized processing of thermograms for the purpose of detecting flaws in products undergoing inspection, and also for diagnosing various illnesses.

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CSO: 1840/1251-E

## AVIATION INSTRUMENT BUILDERS DEVELOP MEDICAL INSTRUMENTS

Moscow PROBLEMY I RESHENIYA in Russian No 10, 20 May-2 Jun 86, p 6

[Text] At the Leningrad Institute of Aviation Instrument Building (LIAP), there is a student experimentation laboratory (STELA) that is very active. It has developed more than 70 unique instruments that are being used in various cities.

LIAP students have firm contacts with the Medical Institute No 1, the Institute of Physical Culture, the USSR Academy of Sciences' Institute of Physiology imeni Pavlov, and the USSR Academy of Medical Sciences' All-Union Cardiological Center. Instruments developed by the students are helping physicians to treat people, biologists to conduct experiments, and athletes to set new records. For example, an apparatus called "Trener-2" records an athlete's pulse instantly and accurately. An instrument called "VARIO-K" quickly reveals a patient's predisposition to impairments of heart function.

(The photograph shows student inventors demonstrating their "Trener-2" apparatus.)

FTD/SNAP

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CSO: 1840/1252-E

## EYE BURN THERAPY IN PRESSURE CHAMBERS

Moscow MEDITSINSKAYA GAZETA in Russian No 51, 25 Jun 86 p 1

[Abstract] The Balashikha Central Rayon Hospital is one of the largest in Moscow Oblast. More than 200 physicians (including three candidates of medical sciences and four meritorious physicians of the RSFSR) and about 500 middle-level medical personnel are rendering skilled assistance to the population of the city and the rayon here. The hospital is a multiple-specialty one and it has well-developed, specialized services. It is well outfitted with new equipment. Thanks to this, modern diagnostic and therapeutic methods are widely employed here, such as treatment by the method of hyperbaric oxygenation, particularly in cases of eye burns.

(Two photographs are given showing Candidate of Medical Sciences B. M. Kostryukov, head of the hospital's department of hyperbaric oxygenation; and two of the department's pressure-chamber beds with adjacent instrument cabinets).

FTD/SNAP

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CSO: 1840/1255-E

## MEDICAL INSTRUMENTATION

Moscow HOME SERVICE in Russian 19 May 86

[Text] Summary. A scientific production center for new medical instruments has been formed in Tomsk. Correspondent Gennadiy Chudnyy reports from there; he describes a miniature electric stimulator intended for treatment of stomach and intestine. It weighs 5 grams only and is introduced into the body like a tablet. It is already being produced serially. It has been created by Vikentiy Vikentyevich Pekarskiy, professor at the Tomsk Medical Institute, in collaboration with Viktor Filipovich Agafonik, chief of the laboratory for micro-electronics of the Institute of Automated Control Systems and Radio-electronics. They also developed and created a stimulator probe which carries out not only diagnoses, but also treatment of a number of gastrointestinal diseases.

Pekarskiy reports that research into problems of electroimpulse therapies of cardiac arrhythmia is being conducted. In Tomsk, an experimental prototype of an automatic implantable cardio-defibrillator has been developed. It controls the activity of the heart and in cases of heavy arrhythmia it eliminates it automatically. It is envisaged that these instruments will be serially-produced at the end of the 12th Five-Year Plan period at enterprises of the city of Tomsk.

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CSO: 1840/1249-E

## DIAMOND SCALPELS FOR EYE SURGERY

Smolensk TASS in Russian for abroad 27 Jun 86

[Text] Summary. The Smolensk firm "Kristall" has begun producing micro-metric diamond cutters for use in improving the eyesight of patients. Their blade is 100 times finer than an ordinary razor. Whereas, in the past, surgeons have been able to correct eyesight by up to 4-6 diopters, it is now possible to achieve upwards of 10 diopters. At the same time cutting of the optic tissue is reduced 40 times.

/5915

CSO: 1840/1250-E

BRIEF

MONOFILAMENT FOR SURGICAL OPERATIONS--The experimental shop of the Kiev Khimvolokno [Chemical Fiber] Production Association was the first in the country to begin the production of a monofilament for surgical operations in the country. Its thickness ranges from 25 to 80 microns. This year medical clients will receive 60 kg of the almost invisible filament. Scientists at the Institute of Problems of Material Science of the Ukrainian SSR Academy of Sciences helped production workers to master the new product. [Text][Minsk NARODNOYE KHOZYAYSTVO BELORUSSII in Russian No 4, Apr 86 p 2] 11439/5915

CSO: 1840/1207

## TITANIUM-NICKELIDE MEDICAL INSTRUMENTS AND PROSTHESES

Moscow NEDELYA in Russian No 22, 26 May-1 Jun 86 pp 6-7

[Article by Leonid Levitskiy and Vladislav Starchevskiy]

[Abstract] the article reports on research dealing with materials possessing the property of shape memory and applications for them, conducted at the Siberian Physical-Technical Institute in Tomsk. Work for industry on alloys with this property and on processes for producing them reportedly is being done under the direction of scientists affiliated with this institute, including Doctor of Physical-Mathematical Sciences A. Korotayev, head of a department; Yu. Paskal, docent of Tomsk State University; and Candidate of Physical-Mathematical Sciences V. Itin.

Attention is focused on medical-equipment R&D of the institute laboratory headed by Candidate of Physical-Mathematical Sciences Viktor Gyunter. It is noted that Gyunter studied the effect of shape memory in titanium nickelide when he was a student at Tomsk State University. He received a prize of the Leninist Communist Youth League for work on a process for producing alloys with shape memory. Gyunter's subsequent work at the physical-technical institute attracted the attention of specialists who were interested in prospective medical applications of alloys of this kind. It was proposed that clips, splinting devices and other metal parts with shape memory be developed for use in trauma therapy and orthopedic and oral surgery, in particular. The physicists received support from such medical scientists as Professor I. Vityugov, director of the Novokuznetsk Institute for Advanced Training of Physicians, and V. Kotenko, docent of this institute's chair of traumatology, who has employed titanium-nickelide devices successfully in the treatment of fractures. Their use has accelerated the knitting of bones by 50 to 100 percent, it is claimed.

Developments of Gyunter's laboratory include a porous variant of titanium nickelide through which tissue can grow. Artificial finger phalanxes made of this material have been implanted successfully. The laboratory also developed a device made of thin wire with shape memory which was used at the Tomsk Medical Institute to suture a deep lacerated wound. Metals with shape memory also expand possibilities for operations on internal organs and in other places where surgical intervention is difficult, according to Candidate of Medical Sciences G. Dombayev, head of this institute's chair of surgery. Gyunter mentioned that his laboratory has developed a whole series of titanium-nickelide instruments for surgery. They include scalpels which can be twisted temporarily into unusual shapes for making incisions or reaching places inaccessible to other instruments.

It is noted that to advance shape-memory R&D with medical applications, an inter-sector council has been created with physicians and physicists as members. Gyunter's laboratory was recently authorized to begin small-scale production of titanium nickelide for use in medicine. Several hundred kilograms are scheduled for production in 1987.

FTD/SNAP

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CSO: 1840/1251-E



UDC 616-001.34-057-02:613.644

#### IMMUNOLOGICAL SEQUELAE OF VIBRATION SICKNESS

Moscow GIGIYENA TRUDA I PROFESSIONALNIYE ZABOLEVANIYA in Russian  
(manuscript received 28 Jun 85) pp 54-56

[Article by M. M. Asadullayev, Institute of Sanitation, Hygiene and Occupational Diseases, Uzbek SSR Ministry of Health, Tashkent]

[Abstract] A group of 84 male workers, 30-50 years old, with vibration sickness was assessed for the status of their circulating T and B cells, as well as IgG, IgA and IgM levels, in order to define the effects of such a disorder on the immune system. The results showed marked depression of the T cell system, both in terms of quantitative counts and blast transformation following a challenge with phytohemagglutinin, and an increase in the level of B cells. The latter correlated with a statistically significant elevation of all three immunoglobulin classes, but particularly of IgG and IgA. These observations indicate that vibration sickness affects the immune system in toto and that the effects are related to the clinical severity of the sickness. As such, these immune parameters can also be utilized in monitoring the course of the underlying disease and the effectiveness of therapeutic measures. References 9 (Russian).

12172/5915  
CSO: 1840/2203

UDC 617-089.843:615.847.8+615.847.8.03:617-089.843

#### USE OF PERMANENT MAGNET IMPLANTS IN SURGERY

Moscow VESTNIK AKADEMII MEDITSINSKIKH NAUK SSSR in Russian No 11, Nov 85  
(manuscript received 26 Feb 85) pp 72-77

[Article by V. D. Fedorov, Scientific Research Institute of Proctology, RSFSR Ministry of Health, Moscow]

[Abstract] A brief description is presented of the creation of continent colostomies by the implantation of a magnetic ring around the emerging intestinal opening, with the ring holding a close-fitting mushroom-like metal plug. The plug is imbedded in polyethylene, and the magnetic ring is enclosed in a

titanium capsule covered by silicon coating. In distinction to the Coloplast device used abroad, the Soviet device employs a radially magnetized ring. The latter feature reduced 4-fold the weight of the magnet, yet allows for continent closing. To date, the Soviet device has been installed in some 250 patients with excellent 5-year results. In almost 80% of the cases the colostomies remained continent, allowing the patients to resume work. Figures 4; references 12: 11 Russian, 1 Western.

12172/5915  
CSO: 1840/2219

UDC 616.98:579.852.13]-008.6-092.9-07:616.745-008.939.633.2

MECHANISMS UNDERLYING CHANGES IN ENERGY METABOLISM OF RESPIRATORY MUSCLES IN EXPERIMENTAL BOTULISM

Moscow VOPROSY MEDITSINSKOY KHIMII in Russian No 3, Mar 85  
(manuscript received 5 Dec 83) pp 64-67

[Article by V. V. Morrison, Chair of Pathologic Physiology, Saratov Medical Institute]

[Abstract] In order to obtain a better biochemical understanding of botulism, albino rats were employed in a study on energy metabolism of the respiratory musculature following intramuscular administration of type C botulin (0.05 mg/kg). Analysis of the levels of ATP, ADP and AMP in the intercostal muscles and the diaphragm revealed, in essence, a time-related significant decrease in the concentrations of the adenylic nucleotides, which was correlated with clinical deterioration. A similar change was observed in the spinal cord. The results of administration of 4-aminopyridine to the rats with experimental botulism, an agent that activates neurotransmitter release, suggested that the depression of the nucleotides was probably due to inhibition of synaptic release of acetylcholine. Combined administration of 4-aminopyridine + alpha-tocopherol (inhibitor of lipid peroxidation) to such rats led to a complete or partial reversal of the decline in ATP, ADP and AMP in the muscular and nervous tissues, the effectiveness depending on the time of administration after intoxication (2-5 days). These observations indicate that both synaptic inhibition and activation of free radical processes contribute to the course of botulism, and that combined use of 4-aminopyridine and alpha-tocopherol suggests a therapeutic solution. References 11: 6 Russian, 5 Western.

12172/5915  
CSO: 1840/2227

## RARE COMPLICATION IN LEPTOSPIROSIS

Moscow KLINICHESKAYA MEDITSINA in Russian Vol 64, No 4, Apr 86  
(manuscript received 13 Feb 85) pp 129-131

[Article by N. B. Primachenko, G. M. Belyak and I. S. Biryukov, Chair of Infectious Diseases (Chairman: N. B. Primachenko), Kuban Medical Institute; Anatomical Pathology Division (Chief: I. V. Palyukhovich), Krasnodar Kray Clinical Hospital]

[Abstract] An interesting case of icterohemorrhagic leptospirosis complicated by acute pancreatitis and pericarditis is described. This complication was found only after exploratory surgery. Clinical diagnosis identified icterohemorrhagic leptospirosis complicated by liver-kidney insufficiency, histopathic pneumonia, toxic myocarditis, anemia and toxic, corrosive gastroenterocolitis. On the basis of detailed histological and anatomical pathological findings, the complications cited above were discovered. A conclusion was reached that, in difficult cases of leptospirosis, consultation is needed with surgeons and cardiologists. References 7: 4 Russian, 3 Western.

7813/5915  
CSO: 1840/2259

UDC 340.624.1:616.153.42.099:546.262.3-31]-02:614.84

## CARBOXYHEMOGLOBIN LEVELS IN BLOOD AS CRITERION OF PRE-DEATH EFFECTS OF FIRE

Moscow SUDEBNO-MEDITSINSKAYA EKSPERTIZA in Russian No 2, Apr-Jun 86  
(manuscript received 8 May 85) pp 32-33

[Article by V. Ye. Yastrebov and K. P. Bugar, Moscow]

[Abstract] Blood level of carboxyhemoglobin (HbCO) is one of the principal tests in forensic medicine assisting in evaluation of the CO poisoning and in search for the causes of death among air crash victims. In the latter case it is necessary to consider possible changes occurring in the body after death. Data on this subject are scarce and often contradictory, hence an attempt was made to investigate this question on white rats. The results showed that after death has occurred, the blood level of HbCO could possibly increase but not more than by 10% as a result of fire or high CO content. No post mortem formation of HbCO was possible that would result in higher blood levels of HbCO. Figures 2; references 9: 4 Russian, 5 Western.

7813/5915  
CSO: 1840/2213

UDC 613.68:613.32.546.571-074

RAPID PHOTOMETRIC METHOD TO DETECT SILVER IN POTABLE WATER ON BOARD SHIP

Moscow GIGIYENA I SANITARIYA in Russian No 1, Jan 86  
(manuscript received 10 Jul 85) pp 34-35

[Article by A. T. Pilipenko, A. A. Koval, V. L. Kanibolodskiy, G. S. Matsibura, V. I. Svarnik and A. V. Terletskaya; UkSSR Academy of Sciences Institute of Colloid Chemistry and the Chemistry of Water imeni A. V. Dumanskiy; UkSSR Ministry of Health Kiev Basin Sanitary-Epidemiological Station]

[Text] It is a known fact vessels on endurance cruises lasting 30 days or more carry equipment to render outside (sea) water potable by desalination and subsequent disinfection of the mineralized water. Silver electrolysis is recognized as one of the most reliable methods of disinfection and stabilization of potable water [1, 2, 5]. Between 0.2 and 0.5 mg/l of silver is used in the primary disinfection of water taken on board from an onshore hydrant or water barge [3]. The silver content in the water released for consumption ought not to exceed 0.05 mg/l. This being so, it is important to monitor the silver level by analyzing the water at various stages of treatment involving silver ionizers (when the water is drawn from the ionizer, in the potable water reservoir, and when the water is released for consumption after desilvering filtration).

We have developed a new rapid photometric method to detect silver in potable water which is based upon the formation of a red-violet complex of silver with Michler's thioketone (TKM) in an anionic surface-active medium (dodecyl sodium sulfate--DDS). The use of DDS as a medium increases the sensitivity and contrastivity of the chromatic reaction. In optimum reaction conditions (pH factor 5.0 to 9.0), the molar adsorption coefficient of the complex is  $1.7 \times 10^5$  at a maximum adsorption wavelength of 530 nm. This method has a detection limit of 5  $\mu\text{g/l}$ , which meets the mandatory sensitivity requirements. Detection error is 5% maximum permissible concentration. The effect exerted by macro- and trace elements in potable water upon the detection of silver with TKM in a DDS medium was studied. The macro-elements of potable water included in this study were the hard salts Mg (II) and Ca (II) and chloride ions in quantities permitted by GOST [All-Union State Standard] 2874-83. The trace elements selected for study were bromide and fluoride ions, residual quantities of chlorine, and organic substances which replicated the introduction of humite acids.

It was established that elements in potable water have virtually no effect upon the detection of silver with TKM in a DDS medium with a pH of 5.0 to 9.0. In optimum reaction conditions, when complex-forming substances ( $\text{Na}_2\text{CO}_3$ ,  $\text{Na}_6\text{P}_6\text{O}_{18}$ ) are present, silver detection is not adversely affected by chloride ions in concentrations of up to 10 g/l, bromide ions in concentrations of up to 500 mg/l, residual free chlorine in concentrations of up to 20 mg/l, or humite acids in concentrations of up to 10 mg/l. A sodium hexametaphosphate solution was used in developing a method to eliminate the obstructive effects of the hard salts of Ca (II) and Mg (II), which at concentrations of 7 to 10 mmol/l and a pH of 5.0 to 9.0 react with DDS to form insoluble salts. Sodium sulfite, a powerful reducing agent, blocks the effect of residual quantities of chlorine. It also dissolves silver chloride, which forms when silver nitrate or ionization methods are used to stabilize potable water, and breaks down silver complexes with organic elements in water. Furthermore, the addition of up to 0.5% sodium sulfite does not affect the interaction of silver (I) and TKM in a DDS medium. It should be stressed that the method herein recommended permits the detection of extremely small quantities of silver in the presence of a  $10^4$  to  $10^5$ -fold excess of chloride ions.

This method therefore has several advantages over known photometric methods of silver detection [4]; namely, greater sensitivity, the possibility of inducing a reaction in an aqueous solution without need for extraction, and the fact that significant quantities of chloride ions and organic substances do not impede detection. Based upon this method, an instrument (the SV-82) has been devised for the rapid visual photometric detection of residual concentrations of silver in potable water on board ship (see illustration of the SV-82, an instrument for the rapid visual photometric detection of residual concentrations of silver in potable water on board ship). The main part of the instrument is the silver indicator. In the body of the indicator there is a mounting with six vials containing scaled colored solutions. The mounting has a tube holder for a colorimetric cuvette containing the test solution. Replicate solutions are employed in preparing the scaled solutions, and standard solutions of silver nitrate are used in scaling them. The scaled solutions range from light yellow to red in hue and correspond to the following concentrations of silver in potable water: 0.015, 0.03, 0.05, 0.07, 0.10, and 0.15 mg/l. The vials containing the colored solutions are reflected in a mirror and appear on the indicator screen as six colored circles on a black background. The instrument comes complete with the reagents that are needed for water analysis:

1. Reagent A--TKM, 0.05% solution in dimethylformamide; 2. Reagent B--a mixture of 3% DDS in aqueous solution and a 1% solution of sodium hexametaphosphate (6g DDS and 2g sodium hexametaphosphate dissolved in 200 ml heated distilled water); 3. Reagent C--sodium sulfite (dry preparation). The quantity of reagents supplied with the instrument is sufficient for 200 determination procedures. Fresh reagent solutions are prepared in fixed laboratory conditions.

Silver concentration is determined by visually comparing the hue of the test solution with that of the scaled solutions. To do this, 20 ml of the potable water to be analyzed is measured out in a measuring cylinder and reagent C is added from the tip of a measuring spoon and mixed until the salt is fully dissolved. Then 1 ml of solution B is poured in and 1 to 4 drops of solution A added to the resultant solution, mixing carefully after each drop is

introduced. The colored solution is poured into the colorimetric cuvette until the fill-mark is reached, the cuvette is set in the empty tube holder in the indicator, and the hue of the test solution is compared with that of the scaled solutions. For this purpose, the indicator is placed so that the vials are lit from above. The reflection of the vials in the mirror is viewed through an aperture in the lower section of the indicator. The analysis takes no more than five minutes and can be performed on board ship not only by the ship's medical staff but also by any crewmember responsible for water disinfection and conditioning. The shipboard version of this instrument can be included in the equipment manifest of the ship's sickbay or dispensary. The margin of error in silver detection with the SV-82 does not exceed 20% for concentrations of 0.05mg/l, which meets the requirements for rapid analysis.

The instrument has been tested under laboratory conditions and on vessels of the Black Sea Shipping Company and the UkSSR Main River Fleet Administration [Glavrechflot]. Both the method and the instrument to detect residual quantities of silver in potable water have been given a positive rating by the Kiev Scientific Research Institute of General and Communal Hygiene imeni A. N. Marzeyev (UkSSR Ministry of Health) and approved by the UkSSR Ministry of Health. Permission has been granted to develop the specifications of this instrument, to proceed with series production, and to bring this instrument into use on marine and river vessels.

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13185/5915

CSO: 1840/2191

## PHARMACOLOGY AND TOXICOLOGY

### REDUCTION OF HOSPITALIZATION OF PSYCHIATRIC PATIENTS VIA DRUG THERAPY

Moscow MEDITSINSKAYA GAZETA No 47, 17 Jun 86 p 3

[Article by Yu. Lutskevich]

[Excerpt] A patient being examined was diagnosed as a case of affective psychosis. A medical psychoneurologist prescribed lithium. This preparation has been known for a long time, but how the patient will react to the medicine cannot be known every time. It is a question that takes weeks to clarify.

Can bodily reaction be forecast on the basis of a control dose? Associates of the USSR Academy of Medical Sciences' All-Union Mental Health Research Center (VNTSPZ) undertook to answer this question.

They began with lithium. The clinical picture indicated that its therapeutic effect is achieved when there is a sufficient concentration of the preparation in the blood, but this level is reached differently in each patient, depending on bodily characteristics. By means of mathematical modeling of pharmacokinetic processes which determine the effect of the body on a medicine, the researchers were able to assess bodily characteristics in quantitative categories.

The scientists went further, seeking to determine whether the action of other psychotropic preparations could be forecast. Tests of chlorpromazine demonstrated that this was possible in principle, but the methods used to determine its concentration were too complex to introduce in clinics. The scientists then tried leponeks, a preparation to which practicing psychiatrists are turning. It was established that preliminary prognoses of receptivity to it were just as effective as those in lithium therapy. Associates of the laboratory already had experience in the drafting of a comprehensive program called "Lithium" for scientific institutions of the country. Lепoneks was first tested in psychiatric centers in Leningrad, Lvov, Tbilisi, Minsk and other cities, using the same methods. The experiment subsequently became an international one. Five research centers of Czechoslovakia joined it, as well as a chair of psychiatry in Jena (German Democratic Republic), the institute of psychoneurology in Warsaw, the institute of psychiatry in Budapest, and the chair of psychiatry at the Medical Academy in Varna (Bulgaria).

"In April, at a symposium in Suzdal, psychotherapists of socialist countries discussed results of the implementation of the program 'Lithium' and of the second phase of research in line with the program 'Leponeks'," said V. A. Gor'kov, head of VNTSPZ's laboratory of clinical psychopharmacology and pharmacokinetics.

The VNTSPZ scientists are mainly concerned about the practical implications of their theoretical studies. A strategy for treating mental illnesses in the population is being defined in the center's department of epidemiological research, which is headed by Professor L. M. Shamonova. Alleviation of external symptoms of illnesses is being noted everywhere, and this dictates the strategy of increasing the number of outpatient clinics and reducing the number of hospital beds.

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## INCREASE IN DRUG ADDICTION

Moscow KOMSOMOLSKAYA PRAVDA in Russian 8 Jun 86 p 2

[Article by A. Mostovoy]

[Abstract] This lengthy article is a report on drug addiction among young people, which is said to be a new and not widespread problem, but nevertheless one that authorities are encountering more and more often. The author visited a poppy-growing region of Kuybyshev Oblast, where young people from cities come to gather poppy seeds as a source of narcotics. Farm workers reportedly find used syringes in the fields. The author spoke with local law-enforcement officials, who described practices of the drug trade and cases they have prosecuted. The author also visited a drug-addiction treatment facility and described serious cases that are being treated there. Police officials said they are doing all they can to control the problem, and explained that it is difficult to patrol vast areas of poppy plantations. A reference was made to experience in the Kharkov region, where poppy plantations have been concentrated in a single area that is more easily patrolled. The Kuybyshev authorities said they will try to do more to keep the source of narcotics under control, but they expressed the opinion that the real solution lies in educating people about the dangers of using narcotics.

The article concurs with this opinion, noting that young people are resorting to other types of narcotic substances. The author observes that since restrictions were imposed on sales of alcoholic beverages, people in many cities have begun to find 'surrogates.' One is a mixture of water and an antistatic agent that can be bought in any clothing store. Other substances reportedly can be bought in pharmacies, and there are cases of inhaling fumes of glues and paints. Police officials complain that when they detain individuals who appear to be under the influence of some narcotic and take them to hospitals, doctors do not know what they are dealing with.

In urging that greater efforts be made in the way of public education, the author suggests that young communist organizations have been unattentive to this work.

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PRIZE NOMINATION FOR STUDIES ON NEUROGENIC VISCERAL PATHOLOGY

Moscow MEDITSINSKAYA GAZETA in Russian No 44, 30 May 86 p 3

[Article by Ye. Gembitskiy, corresponding member of the USSR Academy of Medical Sciences]

[Abstract] The author comments on the nature and results of comprehensive studies done over a period of about 20 years by groups of scientists under the direction of F. I. Komarov, member of the USSR Academy of Medical Sciences, professors V. A. Lisovskiy and V. V. Shchedrunov, and I. S. Zavodskaya, Yu. S. Borodkin, Ye. V. Moreva, N. S. Sapronov, V. V. Korkhov and S. V. Anichkov. They are credited with obtaining fundamentally new data on neurogenic mechanisms of diseases of internal organs, and with developing original principles and methods for pharmacotherapy of neurogenic visceral pathology. The author endorses the nomination of this work for the USSR State Prize.

Results of the research are discussed in some detail. It was established for the first time that impairment of gene function accompanies the development of neurogenic visceral pathology. This impairment has adverse effects on key enzyme systems, and consequently on adaptive bodily functions in extreme conditions. For the first time in world practice, neurotropic drugs were used which act selectively on different links in the nervous system.

An original drug called etimizol, which was proposed by Anichkov, is intended for restoring the activity of the sympathetic nervous system and normalizing bioenergetic and plastic processes in tissues. Etimizol and a drug called I-DOFA, which also stimulates the sympathetic-adrenal system, are said to promote recovery from heart surgery and to improve repair processes in cases of myocardial infarction.

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EFFECTS OF OPIOID PEPTIDES ON GROWTH AND REGENERATION OF RAT NERVOUS TISSUE

Leningrad ZHURNAL EVOLYUTSIONNOY BIOKHMII I FIZIOLOGII in Russian Vol 21,  
No 5, Sep-Oct 85 (manuscript received 6 Mar 85) pp 511-515

[Article by O. B. Ilyinskiy, M. V. Kozlova, Ye. S. Kondrikova and V. U. Kalenchuk, All-Union Cardiological Scientific Center, USSR Academy of Medical Sciences, Moscow]

[Abstract] Studies with explants and tissue cultures of Wistar rat nervous system demonstrated that, in a concentration of  $10^{-9}$  to  $10^{-10}$  M, leu- and met-enkephalins and beta-endorphin exert stimulatory activity on the growth and proliferation of a variety of neural and glial elements. The effects with sympathetic ganglia and spinal cord tissues were observed on the 2nd to the 5th day of culture and generally exceeded corresponding control values 2.5-fold. Naloxone did not block the activity of the opioids, but in fact exerted a growth stimulatory effect of its own and enhanced the activity of the opioids when added to a concentration of  $10^{-5}$  to  $10^{-7}$  M. This appears to be the first communication in the literature on the growth-stimulating activity of the endogenous opioids, which affects the neural, glial and fibroblastic elements of the murine nervous system. Figures 4; references 15: 2 Russian, 13 Western.

12172/5915

CSO: 1840/1229

UDC 616-057-02:613.632:546.3:615.9]-07

METAL TOXICOKINETICS: SIGNIFICANCE IN PREVENTION OF OCCUPATIONAL POISONING

Moscow GIGIYENA TRUDA I PROFESSIONALNYYE ZABOLEVANIYA in Russian  
No 3, Mar 86 pp 1-6

[Article by A. V. Roshchin and E. K. Ordzhonikidze, Central Institute for the Advanced Training of Physicians, Moscow]

[Abstract] A toxicokinetic assessment was conducted in rats on vanadium, chromium, manganese, cobalt, zinc, silver and cadmium, in order to provide a basis for the prevention of occupational toxicity and patient monitoring. Administration of the metals by various routes demonstrated that systemic

uptake was most efficient after intraperitoneal injection, followed in order of decreasing efficiency by the subcutaneous route, intratracheal route and the intragastric route. Maximal blood concentrations were reached in 10-15 min to 1-4 h, suggesting the utility of blood monitoring. Maximal tissue accumulation was seen in 24 h, with predominant localization in the liver and kidneys. Most of the metal was eliminated from the body within 48 h. After parenteral administration chromium, vanadium, cobalt and zinc were primarily excreted via the kidneys, and manganese, silver and cadmium via the gastrointestinal system. The study showed that single-dose administration served as a suitable model for long-term ingress in terms of toxicokinetics, and that in clinical situations, physicians should be alert to renal and hepatic problems as initial manifestations of metal toxicity. Figures 3.

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CSO: 1840/2203

UDC 613.632:547.533]-07

# ELECTRONIC STRUCTURE, TOXICOMETRIC PARAMETERS AND HYGIENIC REGULATION OF HALOGENATED TOLUENE DERIVATIVES

Moscow GIGIYENA TRUDA I PROFESSIONALNYYE ZABOLEVANIYA in Russian No 3, Mar 86 (manuscript received 17 Jul 85) pp 6-11

[Article by I. P. Ulanova, P. N. Dyachkov and A. I. Khalepo, Institute of Labor Hygiene and Occupational Diseases, USSR Academy of Medical Sciences, Moscow]

[Abstract] A quantum chemical approach was taken to correlate electronic structure and toxicometric data for experimental animals with regard to halogenated toluene derivatives in order to define the usefulness of this method in setting safety standards. Regression analysis of acute toxicity and donor characteristics of the molecules yielded correlation coefficients in the range of 0.870 to 0.989, indicating that electronic structure of the compounds can serve as an indicator of toxicity. On the basis of such calculations, the permissible exposure levels for  $C_6H_5CCl_2F$ ,  $C_6H_5CClF_2$ ,  $ClC_6H_4CH_2Cl$  and  $ClC_6H_4CCl_2F$  were set at 2, 13, 0.5 and 0.5  $mg/m^3$ , respectively. Additional tabulated data are provided for other halogenated toluenes showing excellent agreement between calculated and experimentally-derived permissible exposure limits. Figures 4; references 11: 9 Russian, 2 Western.

12172/5915  
CSO: 1840/2203

# MOLECULAR MECHANISM OF TOXIC ACTION OF ALAN-1 (NOVEL COMMERCIAL EXTRACTANT OF RARE AND NONFERROUS METALS)

Moscow GIGIYENA TRUDA I PROFESSIONALNYYE ZABOLEVANIYA in Russian No 3, Mar 86 (manuscript received 21 May 85) pp 17-19

[Article by D. A. Kuznetsov, N. V. Zavyalov, A. V. Govorkov and L. V. Strelkova, Municipal Sanitary Epidemiology Station, Moscow]

[Abstract] A cell-free protein synthesis system was used to test the mechanism of action of ALAN-1 following its injection into mice and rats. The data showed that protein synthesis was inhibited on the order of 40% by ALAN-1, with chromatographic demonstration that ALAN-1 is bound to the ribosome fraction. The inhibition of translation was attributed to the cationic component of ALAN-1--trialkyl ( $C_7-C_9$ ) allylammonium nitrate--which was responsible for the specific binding. In vivo studies with mouse hepatic system demonstrated that short-term administration of potassium orotate to mice treated with a single dose of ALAN-1 (10 mg/kg = 0.1 LD<sub>50</sub>) increased the ribosome content by ca.

27.5% and depressed the inhibitory effects of ALAN-1 by ca. 15%. Figures 1; references 7: 4 Russian, 3 Western.

12172/5915

CSO: 1840/2203

UDC 613.632:615.285.7:547.558.1]-07

# TISSUE DISTRIBUTION AND BIOCHEMICAL EFFECTS OF TOPICAL DIMETHOATE APPLICATION

Moscow GIGIYENA TRUDA I PROFESSIONALNYYE ZABOLEVANIYA in Russian No 3, Mar 86 (manuscript received 22 Jul 85) pp 20-23

[Article by N. P. Baranova, L. G. Aleksandrova and V. F. Kovalenko, Institute of Labor Hygiene and Occupational Diseases, Kiev]

[Abstract] Rats were employed for an experimental study on tissue distribution and effects on enzyme activities of topical exposure to dimethoate, an organophosphorus pesticide. Exposure of the rats to a 560 mg/kg (= 0.5 LD<sub>50</sub>) dose for 1-24 h resulted in inhibition of serum and liver acetylcholinesterase, with maximum inhibition seen after 12 h of application. Serum alkaline phosphatase showed inhibition after 2 h of application; at all other times the activity was elevated or at the baseline level (12 h). Serum activities of acid phosphatase and of alanine and aspartate aminotransferases were generally elevated by the application of dimethoate. Gas chromatographic analysis of tissue for dimethoate showed maximum concentration of the pesticide in the skin after 12 h of application, and in the blood, liver and kidneys after 2 h of application. The study also showed that with time the number of metabolites of dimethoate in

the various tissues increased. These observations indicate that skin contact with dimethoate should be avoided, and that, depending on the dose and duration, it tends to accumulate in the skin, liver and kidneys. References 23: 19 Russian, 4 Western.

12172/5915  
CSO: 1840/2203

UDC 613.632:547.495.2/.4]-07

STRUCTURE-TOXICITY RELATIONSHIPS OF COMPLEX UREA-FORMALDEHYDE-BASED  
POLYMERIC FERTILIZERS

Moscow GIGIYENA TRUDA I PROFESSIONALNYE ZABOLEVANIYA in Russian No 3, Mar 86  
(manuscript received 9 Apr 85) pp 23-26

[Article by V. B. Danilov, T. I. Teplova and V. M. Khasanova, Institute of  
Chemistry, Uzbek SSR Academy of Sciences, Tashkent]

[Abstract] A structure-toxicity analysis was conducted on a variety of complex urea-formaldehyde-based polymeric fertilizers to identify parameters leading to toxicity. Intragastric administration studies resulted in categorization of these fertilizers as low-toxicity agents (class IV), with LD<sub>50</sub> values in the range of 10,550 to 13,450 mg/kg for white mice, white rats and rabbits. Toxicity of the various preparations was generally due to the inorganic components, with inhibition of hemoglobin synthesis and formation of methemoglobin ascribed to nitrate groups. Use of excess urea in the production of these fertilizers leads to products lacking functional carbonyl groups characteristic of formaldehyde and responsible for the latter's toxic properties. The studies support the current permissible exposure limits of 10 mg/m<sup>3</sup> of air. References 5 (Russian).

12172/5915  
CSO: 1840/2203

UDC 613.632:615.335.099.012.6]-07

TOXICOLOGY OF ENZYME PREPARATIONS PRODUCED BY MICROBIOLOGICAL SYNTHESIS

Moscow GIGIYENA TRUDA I PROFESSIONALNYE ZABOLEVANIYA in Russian No 3, Mar 86  
pp 46-48

[Article by P. L. Zeltser, All-Union Scientific Research Biotechnical Institute,  
Moscow]

[Abstract] Extensive analysis of the toxicological characteristics of a variety of enzyme preparations produced by microbiological synthesis have shown that, in general, with limited ingress such preparations are innocuous. However,

under specific conditions they do have allergenic potential as protein molecules, and to that end a  $Z_{sp}$  index has been devised to assess such preparations.  $Z_{sp}$  -- the zone of specific activity--represents the ratio of the threshold limit for a toxic effect to the threshold limit for an allergenic effect. If  $Z_{sp}$  is greater than unity, then allergenic properties of a preparation constitute the limiting indicator of an adverse effect, and, if less than unity, then the preparation is more likely to elicit a systemic toxic effect. If  $Z_{sp}$  is equal to 1 then the enzyme preparation is equally likely to induce allergy and a systemic toxic effect. Of the preparations tested, an alkaline phosphatase was found to have a  $Z_{sp}$  of 2, an amylase and a gluconigrin preparation an index of 1.5, while preparations of pectinase and cellulase had  $Z_{sp}$  values of 1.

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#### TOXICITY OF WATER-SOLUBLE VANADIUM CYCLOPENTADIENYL COMPLEXES

Moscow GIGIYENA TRUDA I PROFESSIONALNYYE ZABOLEVANIYA in Russian No 3, Mar 86 (manuscript received 22 Apr 85) pp 48-49

[Article by V. F. Davydov, V. N. Latyayeva, A. N. Lineva, S. V. Zimina, N. I. Solovyeva and S. M. Masayev, Medical Institute imeni S. M. Korov, Gorky]

[Abstract] Outbred rats were employed in an assessment of the toxicity of several water-soluble vanadium cyclopentadienyl complexes. The  $LD_{50}$  values determined for the intragastric administration of vanadocene citrate, vanadium cyclopentadienyl lactate, vanadium dichlorolactate and vanadocene dichloride were, respectively,  $80 \pm 7.94$ ,  $75 \pm 6.71$ ,  $120 \pm 7.81$  and  $87 \pm 7.11$  [sic]. These agents showed a low potential for accumulation in tissues. The pathologic changes indicative of systemic toxicity affected all the internal organs and consisted of stasis, vasodilatation, and hemorrhages. The kidneys, heart and the lungs were affected to a particularly severe degree. In addition, atrophy of individual neurons was a feature of changes seen in the cerebral cortex. References 9: 7 Russian, 2 Western.

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## ASSESSMENT OF LOCALIZED PERCUTANEOUS ABSORPTION OF SELECTED RUBIDIUM COMPOUNDS AND SENSITIZATION POTENTIAL

Moscow GIGIYENA TRUDA I PROFESSIONALNYYE ZABOLEVANIYA in Russian No 3, Mar 86  
(manuscript received 31 May 85) pp 50-53

[Article by T. A. Akinfiyeva and Kh. Kh. Khamidulina, First Medical Institute imeni I. M. Sechenov, Moscow]

[Abstract] Experimental animal studies were conducted on several rubidium compounds to evaluate them for percutaneous absorption and potential for sensitization. Studies on rabbits and albino rats showed that RbOH was a highly irritating compound on topical application, leading eventually to necrosis and scar formation. However,  $\text{Rb}_2\text{SO}_4$ ,  $\text{Rb}_2\text{CO}_3$  and  $\text{RbH}_2\text{AsO}_4$ , applied in a dose of 20 mg/cm<sup>2</sup>, did not induce any changes in the skin. Intradermal and topical applications in guinea pigs indicated that the rubidium compounds induced hypersensitivity on the basis of the results of specific leukocyte agglomeration and microprecipitation tests. Absorption studies demonstrated that  $\text{RbH}_2\text{AsO}_4$  and  $\text{Rb}_2\text{SO}_4$  were taken up through the skin, while  $\text{Rb}_2\text{CO}_3$  was not. Of the agents tested,  $\text{Rb}_2\text{SO}_4$  possessed the greatest toxicity in rats, as evidenced by a statistically-significant depression in body weight 10 days after application, and elevation of blood SH groups and of cholesterol, and decrease in total protein and albumin. References 1 (Russian).

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## MAXIMUM PERMISSIBLE LEVELS APPROVED BY USSR MINISTRY OF HEALTH IN 1983 FOR TOXIC SUBSTANCES AT WORK AREAS

Moscow GIGIYENA TRUDA I PROFESSIONALNYYE ZABOLEVANIYA in Russian No 3, Mar 86  
pp 53-54

[Article by K. K. Sidorov, Institute of Labor Hygiene and Occupational Diseases, USSR Academy of Medical Sciences, Moscow]

[Abstract] A list is provided for 46 substances for which the USSR Ministry of Health approved permissible exposure levels at work sites in 1983. The substances are also categorized as class I, II, III or IV hazards, and described as to their physical form (e.g., gas, aerosol, etc.).

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## SUBSTANTIATION OF PERMISSIBLE EXPOSURE LEVEL OF THIOUREA IN WORKING AREA

Moscow GIGIYENA TRUDA I PROFESSIONALNYYE ZABOLEVANIYA in Russian No 3, Mar 86  
(manuscript received 3 Apr 85) pp 42-43

[Article by Yu. N. Talakin, L. V. Chernykh, M. Z. Nizharadze, L. A. Ivanova,  
M. V. Savchenko and L. P. Tyurina, Medical Institute imeni M. Gorky, Donetsk]

[Abstract] Four species of animals were employed in series of toxicological studies on thiourea in order to provide a basis for establishing a permissible exposure level for this compound in indoor working areas. The experimental trials demonstrated that thiourea induced thyroid hypofunction, with depression of blood T-3 levels and histochemical evidence of hypothyroidism (e.g., reduced succinate dehydrogenase activity). An air level of  $3 \text{ mg/m}^3$  was determined to be the threshold level for thiourea toxicity. Additional studies on workers engaged in the packaging and transportation of thiourea for an average of 9.5 years with exposure to air levels of 0.96 to  $12 \text{ mg/m}^3$  showed extremely low levels of T-3 bordering on the lower normal limit or below it. On the basis of the clinical observations 33% of these workers were diagnosed with euthyroid goiter. Taking into consideration a 10-fold safety factor, the permissible exposure level was established at  $0.3 \text{ mg/m}^3$ . This value has been approved by the USSR Ministry of Health in 1984. References 6: 4 Russian, 2 Western.

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## SUBSTANTIATION OF PERMISSIBLE EXPOSURE LEVEL FOR UREA IN INDOOR AIR OF WORK AREAS

Moscow GIGIYENA TRUDA I PROFESSIONALNYYE ZABOLEVANIYA in Russian No 3, Mar 86  
(manuscript received 5 Apr 85) pp 43-44

[Article by N. I. Kotova, Institute of Labor Hygiene and Occupational Diseases,  
USSR Academy of Medical Sciences, Moscow]

[Abstract] Both clinical and animal trials were conducted on the toxicity of urea in order to establish a permissible exposure level for this compound. The symptomatology noted in 67 workers with 5-10 years of exposure consisted of pains in the chest area, dermatitis, pruritus, and leukocytosis. The experimental studies on rats and rabbits demonstrated that urea behaved as a low-level toxic agent (class III;  $\text{LD}_{50}$  for rats 566.6 to  $616.7 \text{ mg/kg}$ , depending on administration route). Chronic animal administration showed moderate irritation of the upper respiratory pathways and systemic toxicity in the form of protein abnormalities, renal tubular damage, and hepatic changes. On the basis of the clinical observations and results of animals studied, the permissible exposure level for urea was recommended at  $10 \text{ mg/m}^3$ . References 6 (Russian).

12172/5915

CSO: 1840/2203

## TOXICITY EVALUATION OF MEDICAL IMMUNOBIOLOGICAL AGENTS ON DIPLOID CELL LINES

Moscow BYULLETEN EKSPERIMENTALNOY BIOLOGII I MEDITSINY in Russian No 4, April 86 (manuscript received 20 Apr 85) pp 489-491

[Article by A. T. Kravchenko, G. P. Chervonskaya and L. L. Mironova, State Scientific Research Institute of Standardization and Control of Medical Biological Preparations imeni L. A. Tarasevich, USSR Ministry of Health, Moscow]

[Abstract] Trials were conducted with evaluation of the suitability of two cells for toxicity testing of medical immunobiological preparations, such as the DTP vaccine. Specifically, the continuous FL cell line and diploid human embryonic fibroblasts were monitored for their responses to preservatives commonly used in vaccine preparations, in concentrations equivalent to those used in the vaccines. Testing with 0.02% formaldehyde, 100 µg/ml merthiolate and 2 mg/ml aluminum hydroxide demonstrated that these concentrations induced a cytopathogenic effect in both cell lines, although they were tested in concentrations deemed permissible for administration to children. In addition, the human diploid cell line was found to be much more susceptible to the toxic effects of these agents in their initial concentrations and on subsequent dilutions (down to 1:128), and therefore represents the cell line of choice for such testing procedures. Testing by this modality represents an important adjunct to safety testing of vaccines, with the added demonstration that in such tests merthiolate was found to possess the greatest toxicity. References 15: 14 Russian, 1 Western.

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UDC 615.285.7:547.496.2-099.07:331.76

## SERUM ENZYMOGRAM EVALUATION IN WORKERS OF EARLY TOXIC EFFECT SYMPTOMS OF DITHIOCARBAMIDE PESTICIDES

Kiev VRACHEBNOYE DELO in Russian No 8, Aug 85 (manuscript received 24 Apr 84) pp 116-118

[Article by F. A. Onikiyenko, Kiev Scientific Research Institute of Industrial Hygiene and Professional Diseases]

[Abstract] Activity of hepatic enzymes was evaluated on workers involved in the production of the dithiocarbamide pesticide, cyneb (ethylene-1,2-bisdithio zinc carbamate). Several work specialties were evaluated, all workers being exposed to cyneb. A complex hyperenzymemia was discovered with prevalent activation of lactate dehydrogenase (LDH) and alkaline phosphatase enzymes. In overt pathological cases, these changes in serum enzymology were more pronounced. Thus, it was shown that enzymatic studies assist in discovering

harmful effects of cyneb in the preclinical state of intoxication. The following assays were recommended for this purpose: alkaline phosphatase, alanine and aspartate aminotransferases, total LDH activity and its isoenzyme profile. References 6 (Russian).

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UDC 615.015.6

#### CHARACTERISTICS OF PHARMACOLOGICAL TOLERANCE

Moscow USPEKHI SOVREMENNOY BIOLOGII in Russian Vol 100, Issue 3 (6),  
Nov-Dec 85, pp 383-394

[Article by V. N. Amatuni, Institute of Toxicology, USSR Ministry of Health, Leningrad]

[Abstract] A review is presented of largely Western literature on the phenomenon of pharmacologic tolerance, which is treated as a true adaptive cellular response. Organisms that evidence pharmacologic tolerance acquire unique characteristics that reflect functional adaptability which, in turn, is predicated on the genetic potential of the species. Tolerance is characterized by diminished responsiveness to an agent due to repeated (chronic) stimulation, with recovery of full or partial responsiveness possible on discontinuation of administration of the agent, or via a dosage increase. Such a state is, in addition, characterized by increased sensitivity to antagonists of the tolerance-inducing agent, anamnestic persistence of the tolerant state, and transferability of tolerance to intact animals by means of biological materials. Regardless of the mechanisms responsible for tolerance to chemical agents, its existence denotes homeostasis at a level other than that prevalent in the intact organism. References 79: 26 Russian, 53 Western.

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UDC 612.112.31

#### REGULATION OF NATURAL CYTOTOXICITY-MEDIATING FACTORS

Moscow USPEKHI SOVREMENNOY BIOLOGII in Russian Vol 100, Issue 3 (6),  
Nov-Dec 85 pp 395-409

[Article by M. S. Lomakin, I. N. Mayskiy and G. M. Bochko, Institute of Immunology, USSR Ministry of Health, Moscow]

[Abstract] Basically Western literature is surveyed with regard to the various demonstrated and putative mediators of natural cytotoxicity, and the potential usefulness of their regulation. In an outline form, the data garnered to date from the various experimental studies and clinical observations demonstrate that

both positive and negative antigenic stimuli presented by a target cell, e.g., a neoplastic cell, are recognized by both macrophages and--directly or indirectly--by T and B lymphocytes and NK [natural killer] cells. The direct and feedback interrelationships among these various cells are mediated by various chemical entities, such as prostaglandins, interferons, interleukin-2, and so forth, resulting in a finely-orchestrated system involving considerable self-regulation of the effector cells. As the final and/or most important effector, the activity of the NK cells is subject to control by modulation of the various mediating factors. From both the theoretical and practical viewpoints, enhancement or diminution of NK activity could be both beneficial and harmful to the body, rendering this one of the more crucial research areas in modern immunology. Figures 2; references 187: 13 Russian, 174 Western.

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UDC 615.917:415.5/.015.4:616.153.96:546.72

#### EFFECTS OF POLYAMIDE INTOXICATION ON SERUM IRON PROTEINS

Moscow VOPROSY MEDITSINSKOY KHIMII in Russian No 3, Mar 85  
(manuscript received 9 Nov 83) pp 45-48

[Article by P. A. Zolotov, M. L. Keselman and V. V. Vnukov, Rostov Medical Institute, Rostov-on-Don]

[Abstract] The effects of polyimide (PI) and polyamidoimide (PAI) dust inhalation on serum iron proteins was studied in outbred rats to provide additional diagnostic criteria for this form of intoxication. The rats were subjected to either PI or PAI dust in a concentration of 10 mg/m<sup>3</sup> for 5 h/day for 4 months, 5 days/week. With PI inhalation the increases in blood serum hemoglobin levels within a week, one month, and 2 months were on the order of 40, 35, and 16.6%, respectively. The corresponding increases with PAI were on the order of 26, 26 and 25.5%. Subsequent monitoring showed a decline to baseline values. Polyacrylamide gel electrophoretic analysis demonstrated the appearance of two new hemoglobin fractions in the sera of exposed rats, identified as corresponding to intraerythrocytic components 1 and 4. PI and PAI appear, therefore, to damage erythrocytic membranes, causing leakage of hemoglobin into the blood stream. Analysis of serum levels of hemoglobin and identification of its components may constitute a ready approach to diagnosis of PI and PAI intoxication. Figures 2; references 16: 15 Russian, 1 Western.

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ANTIBACTERIAL ACTIVITY OF EXTRACTS OF COMMON NETTLE LEAVES (*URTICA DIOICA*)

Leningrad RASTITEL'NYYE RESURSY in Russian Vol 22, Issue 2, 1986  
(manuscript received 23 May 84) pp 255-257

[Article by L. P. Lezhneva, I. A. Muravyev and V. S. Cherevatyy, Pyatigorsk  
Pharmaceutical Institute]

[Abstract] Several methods were used for preparing extracts of the common nettle leaf (*Urtica dioica*) for testing for antibacterial activity. Water-alkali extracts possessed the highest activity, showing bacteriostatic activity in concentrations of 500 µg/ml against *Staphylococcus aureus*, 62.5 µg/ml against *Bacillus subtilis* and *B. anthracoides*, and in a concentration of 2000 µg/ml against *Proteus vulgaris*. These values represent bacteriostatic concentrations that are 2- to 8-fold lower than those obtained with ethanol and acetone extracts when tested on the same microorganisms. Figures 1; references 8: 7 Russian, 1 Western.

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UDC 581.6:582.951.6(574/575)

SURVEY OF SPECIES OF *VERBASCUM* GENUS IN CENTRAL ASIA AND KAZAKHSTAN

Leningrad RASTITEL'NYYE RESURSY in Russian Vol 22, Issue 2, 1986  
(manuscript received 18 Feb 85) pp 158-171

[Article by A. L. Budantsev and L. V. Kuzmina, Botanical Institute imeni  
V. L. Komarov, USSR Academy of Sciences, Leningrad]

[Abstract] A survey of the distribution of mullein (*Verbascum*) in Central Asia and Kazakhstan has revealed the presence of 13 species, two of which (*V. cheiranthifolium* and *V. sinuatum*) are represented by subvarieties and one (*V. chaixii*) by a subspecies. The forest-steppe and the steppe zones of Western Eurasia contain *V. thapsus*, *V. lychnitis*, *V. chaixii* ssp. *orientale*, *V. phoeniceum* and *V. blattaria*. This area represents the eastern or southeastern limit of their extension. Another group in this genus consists of plants with the alpine regions of Central Asia representing their northern or northeastern limits. The latter plants are represented by *V. sinuatum*, *V. cheiranthifolium*, and *V. macrocarpum*. To the east of the Caspian Sea, the predominant species are *V. turcomanicum*, *V. korovinii* and *V. turkestanicum*. The largest vegetation beds were observed to be formed by *V. songaricum*, and *V. cheiranthifolium* var. *transcaspicum*. Figures 4; references 19: 13 Russian, 6 Western.

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## INDICATORS OF LIPID PEROXIDATION IN CHRONIC PHOSPHORUS INTOXICATION

Alma-Ata ZDRAVOOKHRANENIYE KAZAKHSTANA in Russian No 4, Apr 86 pp 46-47

[Article by N. Zh. Ormanov, I. R. Yunusmetov, M. T. Berdykhodzhin and D. A. Adilbekova, Department of Occupational Diseases, Scientific Research Institute of Regional Pathology, Chimkent]

[Abstract] An assessment was conducted on the status of lipid peroxidation in 60 workers with phosphorus toxicity and 143 probationary workers in a phosphorus plant, to determine whether such biochemical studies can be used to provide indicators of phosphorus intoxication. The factors under analysis were the plasma and erythrocyte membrane levels of diene conjugates and diene ketones, and resistance of erythrocytes to hemolysis. The results demonstrated that the parameters of interest showed a 1.3- to 4-fold increases in the patients with chronic phosphorus intoxication and in the probationary workers, in comparison with the values determined for a group of 40 healthy control males. In addition, both groups of workers showed a predisposition to spontaneous hemolysis. These observations were interpreted to suggest that one of the mechanisms of phosphorus toxicity involves enhanced lipid peroxidation and, consequently, damage to erythrocytic membranes. References 7 (Russian).

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## CLINICAL COURSE OF ACUTE INTOXICATION WITH ORGANOPHOSPHORUS INSECTICIDES

Kazan KAZANSKIY MEDITSINSKIY ZHURNAL In Russian Vol 66, No 4, Apr 85  
(manuscript received 13 Sep 84) pp 274-276

[Article by I. G. Salikhov, Ye. S. Margolin and F. Ya. Khalitov, Chair of Internal Diseases, Therapeutics Faculty, Kazan Order of the Red Banner of Labor Medical Institute imeni S. V. Kurashov]

[Abstract] Case histories were analyzed of 174 patients with acute intoxication with various organophosphorus insecticides as a result of peroral ingress (in 90% of the cases with suicidal intent). In cases with dichlophos and chlorophos ingestion the degree of toxicity can be judged from manifestations of the M-cholinomimetic syndrome and the efficacy of atropine administration within the initial 1-6 h of treatment. Adequate atropine should be administered, even up to the point of early signs of overtreatment (which was evident in 20% of the patients). The degree of carbophos and metaphos toxicity cannot be evaluated from the manifestations of the M-cholinomimetic syndrome, but from the manifestations of the N-cholinomimetic syndrome in the form of convulsions and myasthenia. The latter cases should be managed in addition with 3% pachycarpine (3-4 ml 3-4 X/day). Hemosorption, peristalsis stimulants, blood transfusion and protein preparations and general supportive measures should be vigorously pursued to minimize mortality which may approach 24% in such cases. Figures 4; references 1 (Russian).

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## LABORATORY INVESTIGATIONAL METHODS IN FORENSIC MEDICINE EXPERTISE ON POISONING

Moscow SUDEBNO-MEDITSINSKAYA EKSPERTIZA in Russian No 2, Apr-Jun 86  
(manuscript received 20 Nov 85) pp 23-26

[Article by R. V. Berezhnoy and A. F. Rubtsov, Moscow]

[Abstract] Current status of several disciplines involved in forensic medicine actions was reviewed; utilization of chemical, morphologic and biochemical laboratory technologies is normally consulted in legal decisions. In the near future, better coordination will be required in the following areas: theoretical basis and practical determination of intoxication with single and multiple agents; development of new diagnostic methods for drug toxicity, pesticide and industrial solvent toxicity; metabolism of toxic agents; study of medical measures undertaken in treatment of poisoning which affect metabolism of toxic agents and deposition of poisons in various organs; development of new methodologies for isolation and identification of toxic agents from human organs and biological fluids. To achieve these goals, the following steps must be undertaken: organization of specialization courses in forensic medicine; intensification of the qualification requirements for clinical chemists; modernization of technical equipment and creation of a reference center for forensic medicine at the Scientific Research Institute of Forensic Medicine. References 5 (Russian).

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UDC 340.67.577.1.08

## PROSPECTIVE APPLICATION OF BIOCHEMICAL STUDIES IN FORENSIC MEDICINE

Moscow SUDEBNO-MEDITSINSKAYA EKSPERTIZA in Russian No 2, Apr-Jun 86  
(manuscript received 20 Nov 85) pp 26-28

[Article by Yu. L. Melnikov, L. S. Velisheva and V. V. Zharov, Moscow]

[Abstract] In recent years biochemical methods have been more and more widely used in forensic medicine. Investigation of redox and hydrolytic activities of enzymes were often helpful in establishing the cause of death. For example, in cases of ischemic heart disease, in frost-related death or in alcohol poisoning, activities of LDH (lactate dehydrogenase) enzymes and the levels of Na and K are often used. However, these studies are used very selectively. Presently, three types of analyses may be recommended for general use in forensic medicine: methods already tested on cadavers, methods currently used in clinical laboratories and the remaining arsenal of registered biochemical methods. It is suggested that a special division should be organized for development and approval of biochemical methods and development of technical personnel at the level of the USSR Ministry of Health and--parallel to it--organizations at republic levels for rapid dissemination of approved methods. References 24: 21 Russian, 3 Western.

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EXTRACTION OF COPPER TRICHLOROPHENOLATE WITH ORGANIC SOLVENTS FROM AQUEOUS SOLUTIONS

Moscow SUDEBNO-MEDITSINSKAYA EKSPERTIZA in Russian No 2, Apr-Jun 86  
(manuscript received 9 Oct 85) pp 50-51

[Article by Kh. S. Zaynutdinov and L. T. Ikramov, Department of Toxicologic Chemistry (Chairman: professor L. T. Ikramov) Tashkent Pharmaceutical Institute]

[Abstract] Copper trichlorophenolate (CuTCP) is used to treat cotton seeds. Because of its toxicity, it should be excluded completely from drinking and irrigational water systems. The effect of pH and different organic solvents on its extraction from water has been investigated. A spectrophotometric method was developed for quantitative determination of CuTCP. CuTCP could be extracted with organic solvent either from acid or base solutions but the optimal pH was 6-7; chloroform extracted 58-64% of CuTCP; diethyl ether: 25-30%; 1,2-dichloroethane: 22-25% and n-hexane: 16-20%. Figures 3; references 4 (Russian).

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## PHYSIOLOGY

### STUDIES OF CELL PROTEIN ROLE IN HIGH-TEMPERATURE ADAPTATION

Alma-Ata KAZAKHSTANSKAYA PRAVDA in Russian 8 Apr 86 p 3

[Text] Ashkhabad--How can a person endure heat more easily? Turkmen scientists are studying this question, which is important for regions with hot climates.

Kh. Ul'masov, senior science associate of the Turkmen Academy of Sciences' Institute of the Physiology and Experimental Pathology of the Arid Zone, told a TASS correspondent: "Anyone who has lived in the south for a long time can tell you how to move about, what to wear and what to include in your diet in 40-degree heat. But few know that the body itself is capable of activating a chain of complex and interconnected defense reactions at the necessary moment. The flexibility of the genetic apparatus of living cells accounts for this phenomenon. Complex reactions which are a kind of response to heat shock occur in these cells. Can people themselves learn how to influence the course of these reactions and thus help their own bodies cope with heat? Yes, they will eventually. A complex of studies has been completed at our institute for the purpose of studying the metabolism of proteins and nucleic acids in various organs of animals in the course of adaptation to high surrounding temperatures. Experiments have confirmed that redistribution of functional loads on various organs takes place in the process of acclimatization to heat. This is what enables an organism to handle complex heat transfer. That so-called heat-shock proteins play a key role in protecting cells against the effects of high temperatures can be presumed on the basis of all of the data that are now available. Obtaining such proteins in highly purified form would make it possible to use them as medicinal additives that heighten resistance to heat. Thorough study and application of this information is opening up great prospects for the study of processes which take place in living organisms in extreme conditions."

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CSO: 1840/1251-E

## SYMPOSIUM ON NEURONAL RECEPTORS AND ENDOGENOUS LIGANDS

Moscow MEDITSINSKAYA GAZETA in Russian No 39, 14 May 86 p 1

[Article by V. Likholtov]

[Text] An international symposium, "Neuronal Receptors, Endogenous Ligands and Biotechnological Approaches", opened yesterday at the House of Unions in Moscow. Taking part in this symposium are leading scientists of the world who are working in the field of neurobiology and genetic engineering. Papers are being given by some of the most eminent Soviet brain researchers and colleagues from socialist countries and a number of Western countries, including the United States, France, Switzerland and Italy.

Academician N. N. Blokhin, president of the USSR Academy of Medical Sciences (AMN SSSR), greeted the participants on behalf of the academy's presidium.

Examined on the first day of the symposium's work were general and theoretical aspects of the study of neuronal receptors of the central nervous system, and of endogenous ligands which control neuronal activity. A paper by N. P. Bekhtereva (USSR) analyzed contemporary notions of the neurophysiological principles of the thought process. A paper by E. Kost (USA) was devoted to the theory of contransmission, which explains the involvement of a large number of physiologically active substances of the brain in processes of information transmission and processing in neurons. The symposium also discussed methodological and methodical approaches to isolating new endogenous ligands from nerve tissue.

The symposium is being held within the framework of traditional cooperation between AMN SSSR's All-Union Mental Health Research Center and the International Menarini Foundation. At the meeting in Moscow, problems of neurobiology are being examined for the first time in connection with biotechnological approaches to their solution, which marks the beginning of a fundamentally new and extremely promising direction in brain science.

The symposium will complete its work tomorrow.

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CSO: 1840/1254-E

# SOVIET DISCOVERY OF NEW CARDIAC HORMONE AUREKULINE

Moscow TASS in English 24 Apr 86

[Text] Soviet scientists have discovered a previously unknown hormone produced by the human heart, the journal NAUKA V SSSR reports. It was called aurekuline. In healthy people it contributes to heart pacing. Scientists think that when the auricle overflows with blood, it becomes distended and ejects some quantity of the hormone, which causes the blood vessels to expand too.

Specialists think that the hormone also controls the kidneys and regulates the excretion of sodium from the body. However, they have not succeeded in making the heart produce the hormone at an outside command.

Judging by provisional findings, a surplus of aurekuline has a negative effect on systoles. Soviet scientists believe that when the entire range of the effects produced by the hormone is known, it will be possible to synthesize it to treat hypertension and cardiac deficiency.

Scientists do not rule out the existence of other hormones produced by the heart.

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CSO: 1840/1246-E

USSR ACADEMY OF MEDICAL SCIENCES ANALYSIS OF ARCTIC SKI EXPEDITION DATA

Moscow MEDITSINSKAYA GAZETA in Russian 27 Jun 86 p 4

[Abstract] The article consists of excerpts from a diary kept by Mikhail Georgiyevich Malakhov during the Arctic cross-ice ski expedition which took place in January, February and March of this year. Malakhov served as physician on this expedition. Associates of the Institute of Clinical and Experimental Medicine of the Siberian Department of the USSR Academy of Medical Sciences (AMN SSSR) reportedly are studying data gathered during the expedition in order to formulate criteria for human adaptation in polar conditions.

A short appendix to the article summarizes proceedings of a recent meeting of the presidium of AMN SSSR, which reviewed results of the expedition's medical-biological studies. N. N. Blokhin, president of the academy, praised the scientific and practical importance of these materials. Future joint research by members of expeditions and scientists is expected to yield still more valuable data on adaptational capabilities in extreme conditions, according to Blokhin. Professor L. Ye. Panin, deputy director in charge of scientific work of the Institute of Clinical and Experimental Medicine, reported on new data regarding mechanisms of mental and emotional adaptation, and on changes in temperature and hormonal control and metabolism in organisms exposed to environmental factors of high latitudes.

FTD/SNAP

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CSO: 1840/1258-E

UDC 612.22+612.26](57-18)

OXYGEN TRANSPORT IN INHABITANTS OF NORTHEASTERN USSR

Moscow VESTNIK AKADEMII MEDITSINSKIKH NAUK SSSR in Russian No 11, Nov 85  
(manuscript received 9 Jun 83) pp 68-72

[Article by L. N. Matveyev, A. G. Marachev, V. A. Polikarpov and R. G. Abramyan, Moscow Medical Stomatological Institute imeni N. A. Semashko, RSFSR Ministry of Health; Institute of Human Morphology, USSR Academy of Medical Sciences, Moscow]

[Abstract] An evaluation was conducted on oxygen balance in inhabitant of the Magadan Oblast, in order to derive a better physiological appreciation of human adaptive potential to adverse environmental conditions. The experimental cohort consisted of 41 natives and 76 newcomers, with control data derived from 23 Muscovites residing in Moscow. All of the subjects were males. Comparison of the data for the three groups demonstrated that pulmonary ventilation in the newcomers was far less efficient than in native residents. This was overcome to some extent, however, by more efficient oxygen transport in the blood. Nevertheless, the greater efficiency of oxygen delivery to the tissues from the arterial blood occurred at the cost of reduced oxygen reserves of the mixed venous blood, a factor limiting adaptability of the newcomers to the conditions prevalent in Northeastern USSR. The enhanced oxygen reserve in the natives, predicated on greater affinity of hemoglobin for oxygen, in combination with much more efficient pulmonary gas exchange can be regarded as a successful adaptive mechanism rendering the natives more tolerant of the extreme climatic conditions. References 15 (Russian).

12172/5915  
CSO: 1840/2219

## INTERHEMISPHERIC INTERACTIONS IN DIRECT AND BACKWARD CONTRALATERAL MASKING OF VISUAL STIMULI IN HUMANS

Moscow ZHURNAL VYSSHEY NERVNOY DEYATELNOSTI in Russian Vol 34, No 2, Mar-Apr 86  
(manuscript received 19 Apr 85) pp 385-387

[Article by L. I. Aftanas, Institute of Physiology, Siberian Department, USSR Academy of Medical Sciences, Novosibirsk]

[Abstract] An analysis was conducted on the asymmetry of interhemispheric interference inhibition in contralateral masking of visual stimuli (letters of Cyrillic alphabet) with verbal and spatial cues. The study was conducted on 12 university students, involving assessment of correct perception of the test signals (stimuli) in the left and right visual fields following tachistoscopic presentations as a function of random stimuli pattern with contralateral masking and without. ANOVA analysis demonstrated that the masking structural stimulus and the test verbal or spatial stimulus, when projected into the contralateral visual field, result in interference-based inhibition only in situations with short-interval asynchronous presentation of stimuli. The greater degree of interference inhibition from the right to the left hemisphere indicates an asymmetry in the interference process, suggesting greater functional invariance in the rapid cortical analyzer of the right hemisphere vis-a-vis the left hemisphere. Figures 2; references 5: 1 Russian, 4 Western.

12172/5915

CSO: 1840/2266

UDC 612.822.3+612.821

## CHARACTERISTICS OF PRESTIMULATION EEG IN HUMAN PERCEPTION OF MEANINGFUL LIGHT STIMULI

Moscow ZHURNAL VYSSHEY NERVNOY DEYATELNOSTI in Russian Vol 34, No 2, Mar-Apr 86  
(manuscript received 10 Apr 85) pp 302-308

[Article by L. A. Potulova and A. V. Korinevskiy, Laboratory of Applied Physiology of Higher Human Nervous Activity, Institute of Higher Nervous Activity and Neurophysiology, USSR Academy of Sciences, Moscow]

[Abstract] An analysis was conducted on the characteristics of EEG prior to presentation of LED digital stimuli, to assess the relationship between such characteristics and subsequent perception or lack of it. The study, conducted with right-handed males and females 20-40 years old, involved analysis of monopolar recordings from symmetrical points on the frontal, central and occipital areas of the neocortex of both cerebral hemispheres. The cross-correlation analyses encompassed 5 sec segments in the 0.2-30 Hz band range. Analyses were related to short-latency perception (390 msec), long-latency (627 msec), or failure of recognition. The pre-stimulation EEG patterns were found to reflect both the accuracy and speed of recognition. Highly efficient

perception was characterized by generally unremarkable patterns in the 0.2-30 Hz band in most of the leads, with the exception of an increase in rapid beta waves in the central and occipital areas of the right hemisphere. In addition, the cross-correlation index showed an increase between beta-1 frequencies of the central and occipital areas of both hemispheres, and a decrease for the inter-hemispheric theta and beta bands in the frontal and occipital areas. Figures 3; references 7: 5 Russian, 2 Western.

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UDC 591.185.1:599.9

# DIRECTIONAL PREPONDERANCE IN EXPERIMENTAL NYSTAGMUS FOLLOWING ADEQUATE AND INADEQUATE VESTIBULAR STIMULATION

Leningrad ZHURNAL EVOLYUTSIONNOY BIOKHIMII I FIZIOLOGII in Russian Vol 21, No 5, Sep-Oct 85 (manuscript received 26 Mar 85) pp 504-510

[Article by M. M. Levashov and Ye. P. Maslova, Leningrad Scientific Research Institute of Ear, Throat, Nose and Speech]

[Abstract] An analysis was conducted on the various factors leading to directional preponderance (DP) in experimentally induced nystagmus to assess the diagnostic utility of DP. The analysis was based on the results of caloric tests (bithermal: cool (30°C) and warm (44°C)) and rotational experiments, on the basis of which quantitative evaluations were made of the degree of DP, and contributions of individual factors estimated. The observations that emerged and that have putative diagnostic significance indicated that three indicators could be used to determine the origins of DP: LA (labyrinthine asymmetry), TE (thermostimulatory effectiveness), and DP itself. Dysfunction in the CNS is implicated when LA = 0 and TE = 0. When LA ≠ 0 and TE = 0, the etiology of DP has to be determined on the basis whether the signs of LA and DP match. If the signs of LA and DP are identical, DP appears to originate in the peripheral nervous system, and if they are different then the CNS is involved. A peripheral etiology always prevails when LA ≠ 0 and TE ≠ 0, with further refinements possible to differentiate between warm and cold factors. Figures 1; references 9: 1 Bulgarian, 5 Russian, 3 Western.

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LONG-LATENCY AUDITORY EVOKED POTENTIALS IN HUMANS INDUCED BY MOVING  
AUDITORY STIMULUS

Leningrad ZHURNAL EVOLYUTSIONNOY BIOKHIMII I FIZIOLOGII in Russian Vol 21,  
No 5, Sep-Oct 85 (manuscript received 12 Feb 85) pp 498-503

[Article by S. F. Vaytulevich and S. P. Pak, Laboratory of Hearing Physiology,  
Institute of Physiology imeni I. P. Pavlov, USSR Academy of Sciences,  
Leningrad]

[Abstract] A study was made of auditory evoked potentials (AEP) to analyze perception of a moving auditory stimulus (image) in the case of 20-30 year old male and female subjects. Mobile and immobile clicks were presented monaurally or binaurally with various frequencies (6, 8, 12, 15, 25 and 60 Hz). Analysis of long-latency complexes  $N_1$  and  $P_2$  in the AEPs demonstrated that amplitude of both components increased when two signal parameters were varied: an increase in frequency in a series and with variability in interaural delay. The data indicated that with an 'immobile' moving auditory stimulus (in which the stimulus is located at the center), the increase in the amplitude of  $N_1$  and  $P_2$  with an increase in frequency may be due to changes in the energy level of the stimulus. An interaural delay introduces an additional increase in the combined amplitude of  $N_1$  and  $P_2$  at all frequencies. In the latter case auditory images are formed at low frequencies (6-10 Hz) that correspond to an immobile stimuli spread along the azimuth, while at higher frequencies (15-60 Hz) images are formed that correspond to a movement of the stimulus along the azimuth. Figures 3; references 6: 4 Russian, 2 Western.

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UDC 612.85:414.41+591.185.5:599.9

## PHENOMENON OF ACCUMULATION OF SPECTRAL INFORMATION WITH VOWEL-LIKE STIMULI

Leningrad ZHURNAL EVOLYUTSIONNOY BIOKHIMII I FIZIOLOGII in Russian Vol 21,  
No 5, Sep-Oct 85 (manuscript received 25 Mar 85) pp 487-497

[Article by L. A. Chistovich and T. G. Malinnikova, Laboratory of Speech  
Physiology, Institute of Physiology imeni I. P. Pavlov, USSR Academy of Sciences,  
Leningrad]

[Abstract] Studies were conducted on Russian subjects on the perception of vowel-like stimuli formed by alternating impulses with a steady-state period of 14 msec. The phonetic quality of a stimulus formed by alternating of D and B sounds (signals) was predicted on their spectral characteristics as well as their fractional contribution to the total stimulus. Such a relationship suggests that retention of the 'rhythm' of impulsation from the cochlea accounts for



their melding into a single sequence, i.e., a single sound. This would imply that whenever the basic voice pitch is retained large differences in the spectra of impulses do not affect melding and their perception as a single sound. Each of the successive impulses leads to encoding of spectrally similar phonemes during the interval of the stimulus. Observations on the perception of one- and two-formant vowels indicated that during the stimulus interval the spectral values are accumulated or averaged. In analogy to information processing by a computer, the incoming information is subjected to a number of confirmatory steps prior to averaging, providing that the basic pitch is retained. Subsequent studies will have to be conducted to ascertain the conditions required for the analysis of the component parts of a stimulus. Figures 4; references 14: 7 Russian, 7 Western.

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## PUBLIC HEALTH

### UNORTHODOX FUNDING OF CRITICAL MEDICAL FACILITIES

Moscow IZVESTIYA in Russian 5, 6, 7 June 86

[Series of articles by S. Tsikora, IZVESTIYA correspondent: "Medical Men and Financiers"]

[5 June 86 p. 3]

[Text] 1. GENEROSITY WITH CALCULATION

Medical men have made us accustomed to the notion that it is within their power to perform miracles. But how are we to relate to miracles which are sometimes performed in the depths of medicine itself?

Here, for example, is a fact which was reported to me at the Ukrainian Ministry of Health. The medical men of this republic received 66.8 million rubles in aid in the 9th Five-Year Plan, 86 million in the 10th, and 70 million rubles in the 11th.

Let us call things by their true name. These millions were simply given to them as gifts. Not by the state, and without its cooperation.

For what? Why? What stands behind the practice of multi-million ruble charity?

Let us begin with that which is now no secret to anyone. In the city and on the farm, medical men are given everything--money and lumber, buildings and pumps, automobiles and bricks, pipes and rugs... In Vinnitskaya Oblast this aid has turned into a fantastic chain of events. Let us say that the hospitals have no funds, but this in no way hinders the growth of their new facilities. The polyclinics have no money, but this again is not an insurmountable barrier when rugs were needed for the children's departments.

Let us listen first to Anatoliy Kirillovich Vagalyuk who has long and continuously headed up the Rossiya kolkhoz in Kalinovskiy rayon.

"Why are we so generous in giving aid to medical men," asked A. Vagalyu. "It is not because of the good life, I tell you. I have become convinced by my own experience that for productive work of the collective, particularly in

rural areas, public health today must be given no less attention than the mechanization of labor. I stress--no less! This is because, under the present situation on the farm, when young people are attracted to the city while the long-time residents, naturally, are growing older, the investment of funds into medicine is practically equivalent in profitability and in economic return to the purchase of high productivity agricultural technology..."

I am particularly relating the chairman's speech verbatim because his words pave the shortest way to one of the main points of our story. The kolkhozes today help public health for objective reasons: on one hand--social necessity, and on the other--the unquestionable economic benefit of such help.

The figures convince us of the correctness of this conclusion. Judge for yourselves. In the kolkhoz headed by Vagalyuk there are 535 people of working age and 630 pensioners. Despite such a sharp age imbalance, the monetary income of the farm has been holding stable at a mark of 4.5 million rubles per year. In the chairman's opinion, this level of profitability could never be maintained without the help of the 325 pensioners who have chosen to continue their work in the collective.

No one has to talk veterinarians into returning to work. They have simply been given very attractive working conditions. The farm managers have seen to this on the one hand, and the medical men--on the other. The former have introduced at the kolkhoz a new system of pension provision which allows working pensioners to increase the amount of their pension, and the latter, i.e., the physicians--have retained the work capacity of the people and have safeguarded their health.

A detailed description of this original system of pension provision for kolkhoz workers is the topic for a separate article. I will say only that it is a local invention, but that the people from "Rossiya" are quite happy with it. As concerns the medical aspect of the matter, its organization in Kalinovskiy rayon as well as in the oblast as a whole has turned out to be just as unique as it has been effective. Therefore, in order to clarify the following narrative, I will make a slight digression concerning the history of the question.

The fact is that sociologists and medical men have been observing the rayon in which the kolkhoz "Rossiya" is located for over 60 years now. In 1924, the Ukrainian Narkomzdrav [People's Commissariat of Health] conducted a selective social-hygienic survey of the farms here, among which also were the farms in the present-day Kalinovskiy rayon. At the republic Minzdrav I became acquainted with the results of past and present-day studies.

An interesting picture arose before me. Over the past 60 years, the mortality of the population in Kalinovskiy rayon was reduced to almost one-half its previous number, and the average life expectancy increased from 46 to 72. There is a leap also in the growth of well-being. And yet...in the last 25 years the rayon's population has decreased by almost 13,000 people.

Such is the reality in which Kalinov residents must grow more and more bread every year, give the plants more sugar beets, and not allow a reduction in the kolkhoz herd size. Working hands are needed all around...

"This is why we do not skimp with our funds when it comes to aid for public health," said A. Vagalyuk, explaining the essence of his attitudes toward medicine. "We help with money and specialists. We buy equipment, and we even list medical workers on our staff payroll. As you can see, we do anything to preserve the health of the healthy and to return work capacity as soon as possible to those who are sick. For us, the farmers, this is today the task of tasks..."

And what about the medical personnel? How can they return the good will of the kolkhoz workers?

Here we come to the point where, before our very eyes, the desires of one party may diverge with the capacities of the other. The fact is that the main topic of the kolkhoz chairman--think about it one more time, please, is to preserve the health of the healthy and to return work capacity of the sick. For medical men this means work on a qualitatively new level.

And how are we to achieve this? In general, do the medical personnel working directly on the farms have the capacity for rendering such highly trained aid to their patients?!

For an objective answer to these questions, I will remind the reader that rural public health in its, so to speak, pure form today rests on three "whales": feldsher-midwife points, physician-ambulatoria and uchastok hospitals. These are specifically the medical treatment institutions which have a truly rural stamp. How can they help in the solution of our problem?

We cannot rely on feldsher-midwife centers, since they have no physicians on their staff. It turns out that we lose one "whale" right away.

There are a minimum of three specialists working in the physician's walk-in clinics--a therapist, a pediatrician and a stomatologist. For the present day this is the main force in rendering qualified medical aid to the rural resident. Yet can we expect of these physicians that they "preserve the health of the healthy, return work capacity to the sick" if they do not have a single hospital bed at their disposal, and all of their medical equipment consists of a portable cardiograph and a simple biochemical laboratory?! It turns out that the second "whale" of rural public health also swims away from us.

There remains only the uchastok hospital--the only medical institution on the farm where patients receive treatment under hospital conditions. What help can we expect from it?

In preparing for my trip to Vinnichina, I had a long talk with UkSSR Minzdrav collegium member V. M. Kozlyuk, who heads the Main Administration for Treatment-

prophylactic aid to the republic's population. From him I heard the following:

"We have an increasing number of cases where rural residents categorically refuse to be treated in their uchastok hospitals".

"How is this so?"

"It is all due to the quality of medical aid. After all, they are called hospitals for the most part because there are beds here for hospital treatment, and not because of the quality of care given here. They are usually staffed with 3-4 doctors, and have almost no modern diagnostic apparatus. The results of the treatment also correspond with these conditions. They are considerably worse than in rayon, city and oblast hospitals. This is why people do whatever they can to be treated not at their own uchastok hospital, but at the rayon center, in the central rayon or even the oblast hospital.

Who in the rural area today is capable of organizing medical care in the way that the socio-economic situation which has been formed here demands--to preserve the health of the healthy and to return the work capacity of the sick?

[6 June 86 p 3]

[Text] 2. THE LESSONS OF TWO HOSPITALS

Today in Vinnitsa Oblast there are not even two percent of patients who must be sent beyond the boundaries of their rayon--most often to the oblast center--to obtain medical aid there. In other words, 98 patients out of a 100 resolve all their medical needs on site, even though it is no more than a 2 hour bus ride from any point in the oblast to Vinnitsa with its excellent medical institute and large oblast hospital!

They do not go, they trust their own people. This, perhaps, is the most objective indicator of the quality of work of local medical personnel. But on the background of these "successes by all," there are doctors who are known to be better than others. I present to you two of them, whose reputation is well deserved in a matter which interests us most of all today--how to preserve the health of the healthy and to return the work capacity of the sick.

These specialists have the same duties. Both are head physicians of rural rayons and head up the central rayon hospitals, which for brevity are called TsRB [Central rayon hospital]. Thus, the Kalinov TsRB is headed by Viktor Ksenofontovich Melnik, and the Nemirovskiy TsRB--by Vitold Ivanovich Cherevatyuk.

Today both of these hospitals are well known. The acclaim of the Kalinov TsRB has overstepped the boundaries of the Ukraine, as soon as preparations began in the country for a matter of great social importance--the general dispensarization of the population. This hospital attracted attention to

itself by the fact that local medical personnel have already for 10 years been performing annual prophylactic check-ups of all the residents in their rayon (!). Prophylaxis and keeping a clinical accounting of everything from small to large have become an effective means of preventing illness in the rayon.

The Nemirovskiy medical personnel have a different trump card. Like their colleagues from Kalinovka, they are actively engaged in the organization of preventing illness, but have best proven themselves in organizing the concluding stage of treatment--the stage of medical rehabilitation. The level of this aid may be characterized as follows. The Nemirov personnel have made it a rule to return to production not just a person who has recovered, but one who has full work capacity. On the day of his discharge, the patient may stand at his machine tool, work in a tractor cab, or drive an automobile.

What conclusion may we draw from these two examples?

Alas, not the one which logic would indicate to us--to immediately and everywhere organize institutions of medical prophylaxis and rehabilitation. The essence of the question consists of the central rayon hospital, and in the capacities of its treatment base. If a hospital is strong, this means that all the directions of its activity will be filled with life, including prophylaxis and rehabilitation.

What in reality is the modern-day central rayon hospital? Today almost a thousand medical personnel work at the Kalinov TsRB. There are slightly less than 700 beds here, 15 specialized sections, including those such as reanimation and rehabilitation. The first aid and emergency sections work round the clock, staffed by specialized teams--anti-infarct, anti-stroke anti-shock, pediatric and others. The polyclinic is also well matched to the hospital. In one shift there are up to 900 patients seen here.

Tens of commissions have reviewed the work of the Kalinov medical personnel, defined and recomputed their "main" figure. Everything turned out to be correct: prophylaxis made it possible to reduce to one half--notice, one half!--the losses in the rayon associated with temporary disability. Note also the contingent of patients at whose expense this figure was attained--those suffering from rheumatism, hypertension, cardiac ischemia, ulcers, and afflictions of the musculo-skeletal system.

Prophylaxis has also not overlooked childhood problems. Recently an entire physical training complex has been created at the Kalinov TsRB. It is attended in shifts by the pupils of all the kindergartens in the rayon center. The rayon's enterprises and kolkhozes have helped in organizing the complex.

"Yes, we had to dodge a bit," Anatoliy Ivanovich Poboynya, first secretary of the Kalinov party raykom told me during our meeting there. According to all the financial instructions it is prohibited to obtain for institutions the goods which are sold to the public only for cash. But what if the cause suffers and the very sense of the matter is lost?! After all, a child cannot stand on a bare, cold tile floor after being in a pool. We will give

him a chill and will take his mother away from work for a week in order to care for her sick child. Who needs such physical training, and what will it ultimately cost the state?! I consulted with the ispolkom, with our financiers. I phoned the control-inspection administration. The question for them, of course, turned out to be a familiar one. And there is only one way out of it for them: to pretend that nothing illegal is happening.

"Analyze the budget of any rural rayon," continued A. Poboynya. "The lion's share of its expenditures is taken up everywhere by public health and, notice also that everywhere there is a shortage of these very same funds for medicine. Therefore, I believe that the path toward the industrial enterprises and kolkhozes helping medical treatment and prophylactic institutions is the only correct and realistic path today for improving the quality of medical service to the public."

Later I looked into the matter. This line of the party raykom and the ray-ispolkom in numerical expression over the five-year plan is expressed as follows: from the industrial enterprises and kolkhozes, the rayon's public health received more than a million rubles without repayment! These funds were used to expand the polyclinic, build the uchastok hospital, and open several physician's walk-in clinics...

The same endeavors and unfaltering attention to public health were associated with the name of Poboynya when he was the chairman of the Nemirov rayispolkom. And although the potential of the rayon in which he worked then was significantly less than the potential of Kalinov, the meagerness of the capacities was not reflected in the scope and quality of medical aid given to the local residents. Together with the head physician of the Nemirov TsRB, V. Cherevatyuk, a rather promising idea was realized--a community council was created, under whose auspices the funds of the kolkhozes, sovkhoses and industrial enterprises were combined for strengthening the base of the rayon's medical institutions.

In practice things turned out rather well. Almost one-and-a-half million rubles were collected! These funds were used to build a surgical unit, rehabilitation and ORL-opthalmological sections at the local TsRB. Its capacity was increased to 510 hospital beds.

"The experience of such construction allowed us to strive for more," V. Cherevatyuk, head physician of Nemirovskiy rayon told me. The time had come for the notion of organizing a large rehabilitation section whose center would be a water-mud treatment section. Why specifically this? Our rayon is an agricultural one, and an analysis of the prophylactic check-ups of machine operators and dairy maids has shown that the most frequently encountered illnesses are associated with the support-motor apparatus. In such cases, we cannot get along without methods of water and mud treatments.

As in Kalinovskiy rayon, the losses for temporary work disability were reduced to one-half for the Nemirov residents.

Why did I have to recount in such detail the mechanism of work of the Vinnitsa medical personnel? Here is why. If we combine the experience of the Kalinov and Nemirov TsRB and imagine that a certain specific hospital has this generalized experience at its disposal, we will have a working model for the organization of medical aid in a new manner and on a qualitatively higher level. In essence, we are speaking of the real influence of a process which is equally important to each of us as it is to society as a whole--the process of managing the age for which a person maintains his work capacity.

You might object: there is still more wish than reality in this affirmation. Possibly. But we also cannot ascribe such a conclusion to the realm of ungrounded fantasy. After all, there are already rayons in which total dispensarization of the population is practiced, as well as hospitals with a well organized rehabilitation service.

Something else is remarkable. Where are the treatment institutions in which all this positive experience would be gathered together, under one roof, so to speak?! For now these are only singular examples! What is the problem? What is hindering their organization? What is lacking for their realization: support, effort, rights, funds?

Reality itself has given us the answers to these difficult questions. It arose before me in the form of an abandoned foundation of a building over which the walls of a new therapeutic unit at a rural central rayon hospital had never been erected. The local section of the Gosbank placed a "taboo" on the funds collected by the rayon's kolkhozes and enterprises for this construction.

"Why did they act so harshly?"

"Because it is not a legal construction," they told me.

"What is illegal about it?"

"Everything!" said the financiers.

[7 June 86 p 3]

[Text] 3. BEHIND THE FATAL TRAIT

When they told me that all the innovations in rural public health which I had personally seen and which were later presented as the example to be emulated, upon verification turned out to be not leading experience at all, but a blatant example of illegal action, I thought that I had heard wrong. So I asked again:

"What do you mean--it is all illegal?"

"The fact," they told me, "that the bank has no document allowing transfer of kolkhoz funds for strengthening or reconstructing the central rayon hospitals. According to all our instructions--this is diversion of real funds away from basic production. Therefore, their application for the needs of the central rayon hospital is an illegal action."



The employees of the rayon office of the USSR Gosbank, and then their colleagues from the oblast office, gave the same evaluation of what had transpired. Later they said the same thing in Kiev, at the Ukrainian republic office of the USSR Gosbank.

When my emotions from the acquaintance with them had died down a bit, I asked:

"Well, alright, if the kolkhozes are not allowed to give material support to the main health center on the farm, then to which medical treatment institutions do you recommend that they give this aid?"

The answer I received was once again couched in the words of the circular: They may give aid to feldsher-midwife centers to physician's walk-in clinics, and to uchastok hospitals. In other words--to all who are located directly in the rural area, and to no one who is located beyond the rural boundary!

Everything is clear with the circular. But how is it to be in real life? Let us take the rural uchastok hospital. The cost of maintaining each of its beds--and we must consider this also--is only slightly less than the expenditures for maintaining patients in the central rayon hospital, while the quality and volume of medical aid in these two institutions is hardly comparable.

Do the financiers know about this?

They know it just as well as the medical men do. Yet they do not have the right to solve questions regarding a situation where in one case it is necessary to support, for example, the expansion of the TsRB, and on the other--to help the uchastok hospitals, which are still justifying their function in regions which are remote from the rayon centers. Thirdly, they generally do not want to take the risk of introducing a new idea which requires actions not specified in the instructional paragraphs.

The need for action has made physicians both resourceful and inventive. It is paradoxical, but on the basis of the rural uchastok hospitals they sought the possibility of solving the most burning problem for public health and the practice of economic management.

Their idea turned out to be surprisingly simple. Wherever conditions permitted, the uchastok hospitals were turned into rehabilitation sections...of central rayon hospitals! It was quite obvious: all the patients of the uchastok hospital were immediately taken into the care of the central hospital.

We cannot now determine who was the first in Vinnichina to devise this simple and original thought. The main thing is that here some began to give funds, while others began to transform them into ACTION necessary to all. And the physician became the leading personage in this matter.

What was there in common, you may ask, between the intellectual in the white coat to whom we entrust our soul and our body, and the people whose authority and reputation are earned by their enterprising nature, their persistence, and sometimes--their resourcefulness? Primarily, it was an inventive mind which allowed them to find ways out of situations which seemed hopeless. I was most impressed by the move made by the businesslike physicians in the "game" with the financiers on the eve of the organization of the first central rayon hospitals.

"At that time, no one knew how to build them to get around the bank directives," Stepan Antonovich Markovskiy, head of the public health section of the Vinnitsa oblispolkom, told me, recalling those years gone by. Everyone agreed to give money to build the rayon hospitals--the enterprises as well as the kolkhozes. However, kolkhoz funds, according to the finance laws, could only be used at construction sites which were located exclusively in the rural area. Yet naturally we decided to build the central hospital not on the farm, but in the city, in the rayon center."

"What were we to do? At that time I worked as head physician in Shargorod. We thought and thought--in the raykom and in the rayispolkom--and decided to enlist geography as our ally. Obviously, we did not rename the city a farm, but built the hospital right on the boundary line separating the rural area from the urban. Call this step what you like--a child's trick or casuistry--but the bank did transfer the kolkhoz payments for building the hospital to the builders after this. So, to this day our public health complex of 300 beds stands, so to speak, with one foot in Sloboda Shargorodskaya, and with the other--in the city of Shargorod. But in every matter it is the result that is important. In subsequent years, the entire rural public health base of the oblast was strengthened in this same manner.

And again, how many times now, we must ask the question which is so appropriate after such a story: was this a secret to the financiers? Of course not. Everyone and all saw and knew. But as long as the formal requirements of the instruction had been followed, there were no complaints...

"Even now we are continuing to build extensively in the oblast using the funds of industrial enterprises and kolkhozes," says S. Markovskiy.

"However, the number of hospital beds is practically not increasing. This is explained by the fact that we have taken a course toward improving the conditions of a person's stay in medical treatment institutions. A room for two must be the standard! That is the goal which we have set for ourselves..."

The goal, we must say, is a tempting one. And we must believe that the Vinnitsa residents will achieve it. But let us pose the question: can others repeat the course which has led to the success of the Vinnitsa medical men?

The question is not an idle one. After all, practice has shown many times that not everyone is able to emerge dry from the water when it is necessary--even in the name of a holy cause--to overstep the bounds permitted by the instructions. Even the innovative Vinnitsa doctors, with their huge experience, did not have the power to accomplish everything. After all, the therapeutic unit of one of the TsRB, for whose construction the kolkhozes had collected 1,200,000 rubles to this day stands frozen at the level of the foundation!

The bank said that they had overstepped the permitted boundaries, and even the united forces of all the oblast organizations were not enough to break the financiers and to force them to change their decision.

What can those do who have neither this kind of experience, nor patrons, nor fellow champions?

I began to look into the question of why construction was stopped on the therapeutic unit. I visited the Gosbank oblast office. I listened to the list of infractions for which the financing of the construction had been halted.

"As you see, it is not that we are hard-hearted," said Ya. Mazler, chief of the kolkhoz credit section. "It is that the building site organizers overstepped the boundaries of that which is permitted, for which we, the financiers, are already held strictly accountable. Therefore, we of course cannot close our eyes to such facts. Don't forget that the finance law, according to which not a single cooperative organization may hand over its property, buildings or structures to a state organization without payment has not been repealed by anyone. It is in ef-fect!"

Upon my return to Kiev, I became acquainted with the resolution referred to by the Vinnitsa financier at the Ukrainian republic office of the USSR Gosbank. Yes, indeed, according to it the kolkhozes really cannot give anything to the medical men, and the medical men in turn cannot accept aid from the kolkhozes. Moreover, another circular--a directive letter by the USSR Ministry of Finance and the USSR Gosbank--cited as examples of squandering of funds the cases where in Kharkov oblast the territory of a rayon hospital had been improved at the expense of the raymezhkolkhozstroy, and in Kirovograd oblast a pharmacy did not pay rent to the kolkhoz for using its building.

It turns out that everywhere we try to do good, but become listed as law-breakers!

I asked the UkSSR Minzdrav to give me generalized information on how much money had been "given as a gift" to public health, and how much had been returned to the givers with thanks after a certain time. In three five-year periods this contribution throughout the republic had comprised over 200 million rubles. None had been returned.

What does this tell us? Among other things, it indicates that the development of rural public health has taken one road, while the rules in effect along its thoroughfare seem to be from another. This does not simply hinder the people's initiative and the movement of the new, but is fully capable of representing this new occurrence and its participants in a distorted mirror. And with these prospects, people are in no hurry to select the road along which good deeds may bring just as good of a scolding...

And the problem here is certainly not one of replacing several outdated paragraphs of the instructions. I believe the matter would not be stopped by this. The complexity of the matter lies elsewhere: how to replace participation and proximity to the matter with active involvement in it, how to turn the silent agreement of financiers with the initiative of the Vinnitsa medical men to the plane of active partnership in the management of social processes?

They say that finances are not a sphere for experiments, but the most reliable control column for guiding experiments. Of course, we cannot help but agree with this, But then the bank also should no longer be like the cashier who disinterestedly issues money according to a register which he has not compiled. The time of business-minded people requires the same kinds of partners who are interested and who support every business endeavor. This is what our financiers must become. The time has come now to resolve the question with income as follows: where should these funds be directed most beneficially so as to sharply increase the influx of investments into the budget due to the unerring strategy and within a relatively short period of time. Without such changes, without the formulation of new relations in spirit and in form between initiative and finances, every step forward (as often evidenced by the past) will become for us a double expenditure of energy. And it, this energy, is so much needed today in the work of every one in order to support the movement of all!

12322

CSO: 1840/1223

## INCREASING EFFICIENCY OF MEDICAL RESEARCH THROUGH ORGANIZATIONAL RESTRUCTURING

Moscow SOVETSKAYA ROSSIYA in Russian 30 Apr 86 p 3

[Article by Prof. G. A. Ilizarov, "Economics and Medical Treatment']

[Text] G. A. Ilizarov, the director of the Kurgan Scientific Research Institute of Experimental Orthopedics and Traumatology, a Hero of Socialist Labor and a delegate to the 27th Congress of the CPSU is a regular contributor to our newspaper. In response to a request from our correspondent B. Nuvakhov, the scientist talks about various ways to accelerate scientific and technological progress in medicine.

"I have made a bitter observation: some people have been trying to sink the vital work to which the party has summoned us in a battle of words about reorganization. Of course, in order to see more clearly the ways to restructure each area of social life, one must talk about miscalculations and mistakes, and one must uncover their causes. But "relishers" have appeared--that's what I call those who gladly delve into past mistakes, even castigate themselves for an irresponsible attitude toward their work, but now in practice are in no hurry to improve it.

"Unfortunately, I see a similar picture also in the work of our public health sector, especially in the management of medical science. I will talk about what is closest to me, traumatology.

"I am struck by the following statistic: annually about a billion working days are lost because of illness. Disability benefits paid out amount to more than seven billion rubles. In this unhappy statistic an enormous share of the loss is attributable to injuries and their consequences. But, you know, in our own hands we hold the keys to reducing this loss.

"What is holding up the development of traumatology and making use of new developments? Foremost is the lack of specialized institutes and the real coordination of scientific research. We have not concentrated our efforts and funds on the solution of problems with the greatest priority in our division of science.

"Imitation of work at times takes the place of work itself. And you can find as many examples of this as you'd like.

"Let's take, say, inspectors' trips of scientific research institute specialists to the so-called "zones of trusteeship" in various oblasts of the country. They spend their time there drawing up formal documents, audits, records, and scribbling, that is, they duplicate the functions of the main specialists of the ministries and public health departments or of the administrators of orthopedic and traumatological divisions of oblast hospitals. Can such activity be considered to make a lot of sense in terms of science? Of course not. Such phenomena were the kind the party had in mind when it was said at the Congress that many institutes remain continuations of a ministerial apparatus, not infrequently taking on the role of advocates of departmental interests and have become bogged down in routine and paperwork.

"Closely tied to these organizational defects is extremely poor coordination of scientific research. During many years of work we (yes, I am certain this is true also of many other scientific research institutes) have not felt the influence of the Ministry of Health and its main administration in charge of scientific research. The administration has accumulated dozens, hundreds of proposals which have been received from local areas. They have not been introduced and it's unlikely that anyone will set them in motion. Why? Well, because the person in charge of our program is not in a position to dig through the whole pile of developments and to penetrate into the essence of each one... A conclusion springs to mind: we need to take another look at the organizational forms and methods of administering medical science.

"I see a solution in the creation of problem-oriented scientific centers with a network of specialized institutes or affiliates subordinate to them (as this is done in industry), in which the basic fundamental complex development and research according to their specialized problems must be concentrated. This, I believe, will make it possible to maximize the unification of specialists' efforts, to carry out scientific research more efficiently, and eliminate duplication.

"Moreover, such unification would make possible the exact distribution of equipment and instrumentation and consequently, the more efficient use of them according to plans for scientific research work. In doing so, new and greater possibilities will arise operationally and rationally to maneuver the efforts and funds for conducting and coordinating scientific research on the highest level. Reorganization will significantly ease the work of the Ministry of Health itself.

"I understand that dealing with these issues is not an easy task, but there is an urgent need to get started on them. To expound further on the need for restructuring without actions and decision, in my opinion, is simply immoral. We must once and for all get rid of organizational confusion and the resultant unsound practice of "wage-leveling" in science. Today "wage-leveling" concerns not only individual workers, but also entire scientific teams.

"The main reason for this is that the final results of scientific research are not heeded, nor a most important indicator such as the introduction of these results. This in part leads to a situation in which teams carrying out fundamental research and development that has great applied importance, that has been widely introduced into the practice of public health, and that is an

object of export by licensing agreements "lose" in comparison with those who "beat" them through recommendations and publications on methods. Not infrequently the institutes which have put out the greater number of recommendations on methods look even more preferable.

"After all, it is clearer than clear that the evaluation of a team's work must be carried out not by the amount of paperwork it has produced, but by the actual implementation of that work. Once more this was emphasized at the 27th Congress. We will not be able to solve the proposed problems for accelerating scientific and technological progress if we do not find the levers which will guarantee priorities to those research institutions which actively introduce everything new and advanced. And there is such a lever: to tie closely the material incentive of scientific teams and of individual workers to their real contribution to the solution of scientific and technological problems. In relation to medical science such a lever is not in full force by far. It would seem that there exist special departments of implementation under the State Committee of the USSR for Science and Engineering and under the ministries of health. Everything is in place; only the effect, alas, is hardly felt at all.

"Here is one more example. We have in our institute developed an original method for lengthening the body's extremities by the application of electronic devices. But to make practical application of it is very difficult. Where should we order the instrumentation? This has not been decided yet. And if the interest in our idea remains at the previous level, we risk losing domestic priority in a few years.

"I believe that a stop can be put to this "going through torments" by the creation of a scientific and medical engineering complex with a project and design bureau and an experimental plant subordinate to the Administration for the Introduction of New Medicinal Preparations and Medical Engineering of the USSR Ministry of Health. Their duties should include the development of filing of all the necessary technical documentation and of the technical ideas in an author's certificate. To shorten the approbation period, the experimental plant should prepare not only samples, but also a small series with the subsequent preparation of materials for transfer to series production.

"It is understandable that the proposed complex can solve many problems, but certain development needs to be realized within the framework of intrabranh associations. The Administration for the Introduction of New Medicinal Preparations of the USSR Ministry of Health should allocate such orders. This would significantly shorten the number of instances and the long road from the birth of an idea to its realization, and it would narrow the circle of responsible individuals.

"Whether or not this issue will be resolved in this way or another, one thing is clear: we must work out concrete effective measures with all due haste. It is time to go from words and years of debate on this important problem to doing something.

"I have touched on only certain of the most important problems, from my point of view, in the restructuring of the management of medical science. It is natural that all this has only one aim--to improve the work of our public

health, of medical aid and treatment. The more quickly we solve the problems of accelerating the progress of science and the introduction of its achievements, then the stronger will be the health of each human being. After all, because of it we live and work, and suffer, and create. This is exactly why I decided to expose certain of my proposals to general opinion--I am convinced that publicity will only help the matter.

13085/5915  
CSO: 1840/1190



## COMPARATIVE STUDY OF PHYSIOLOGICAL INDICATORS IN SAILORS WORKING UNDER BRIGADE AND TRADITIONAL SYSTEMS

Moscow GIGIYENA I SANITARIYA in Russian No 2, Feb 86 pp 21-23

[Article by V. N. Yevstafyev, O. Yu. Netudykhatka, V. I. Vigovskiy, B. K. Shayevich and A. P. Stoyanov, Odessa Branch of the USSR Ministry of Health Scientific-Research Institute of Hygiene in Water Transport: "Physiological and Hygiene Characteristics of the Brigade Form of Organizing the Labor and Off-Duty Time of Sailors"]

[Text] At the modern stage of development of industrial production, the brigade form of organizing labor is being widely adopted. The use of mechanization and integrated automation, improved organization and direction of the process of transporting freight, and the improved offshore service of vessels are creating the preconditions necessary for changing the professional activity of sailors. This consists of improving the organization of the labor and off-duty time of a ship's crew, reducing the size of crews and stabilizing them, and partially redistributing service duties in connection with the mastery of new professions and combination of them with direct production responsibilities (2, 5, 6).

One of the versions of the new form of organizing labor is the use of the brigade method on multipurpose dry-cargo vessels, including an extended work day (10-12 hours) when transporting bulk-loaded cargo. This work was carried out on three vessels, on 10 passages, using 85 sailors. The control group consisted of sailors on the same kind of vessels, sailing on the same line.

We studied the conditions and organization of labor and off-duty time, determined physiological and social-psychological indicators, using a computer to process the data obtained, and conducted psychological tests and surveys (1, 3, 4).

As a result of sanitary-hygiene research it has been established that on the whole the vessels investigated satisfy the requirements of the "Sanitary Rules for Seagoing Vessels of the USSR" No 2641-82. At the same time, the noise level is 12-14 decibels A too high in the machine sections, 10-12 decibels A too high in the navigating bridges, and 6-8 decibels A too high in certain living spaces. The vibration levels are 2-7 decibels higher than the norm in machine sections and 3-9 decibels higher than the norm in production areas of vessels. Ships' transportation of powder-form bulk-loaded cargo, the high

specific proportion (23-37 percent) of time spent on loading operations, and the use of a crane scheme of mechanizing loading and unloading are creating the conditions for intensive pollution of the atmosphere on ships with dust from the load to be transported (iron ore concentrate), periodically exceeding the maximum permissible levels by a factor of 2-10.

Study of the organization of labor by the brigade method showed that ship captains and senior mechanics have a single 4-hour period of duty per 24 hours. Other navigators and mechanics put in 10 hours of work time on the job (two 4-hour periods on duty with an interval of 8 hours, and 2 additional hours of administrative work), while duty sailors and motor mechanics work 8 hours (two 4-hour shifts with an 8-hour interval). At anchor as well, in the process of carrying out loading operations, work time for navigators and mechanics (apart from the captain and senior mechanic) totals 12 hours, while for the ordinary crew it is still 8 hours. Sailors, motor mechanics, and electricians work 2 additional hours, carrying out technical service jobs on the hull, mechanisms, and ship systems. Service personnel (cook, food server, work crew member) work an additional 2 hours, brought in for the consumer service of the crew. This organization of labor makes it possible, by accumulating leave time and days off, to grant the sailors regular rest times on shore with a full change of crew after 30 hours of continuous work on board for a time equal to the duration of sailing.

Under the traditional method of organizing labor, a study of the effective utilization of the command staff showed that they routinely work overtime for 20-30 percent of the regulation work time.

A study of direct indicators of work capacity, which characterize the quantity and quality of work based on job research and time studies, made it possible to determine how busy ship specialists actually are, the duration of labor, and the number of mistakes permitted.

Work by the brigade method promotes intensification of sailors' labor. Under this method, for sailors and motor mechanics, the indicators which characterize the heaviness of labor have risen somewhat compared to crew members of vessels which are operating by the traditional method, by approximately 5-10 percent, corresponding to an average degree of difficulty. The labor activities of persons in an operational capacity (navigators, mechanics) was characterized by a higher nervous-emotional component, connected with the nature of the vessels' use in a zone of intensive navigation, and with difficult meteorological and navigational conditions of sailing.

Indicators characterizing the state of mental ability to work with labor activities under traditional conditions attested to the fact that for operators the time of a simple acoustic motor reaction (SAMR) increased in the process of work from  $176 \pm 14.6$  to  $192.3 \pm 13.2$  ms, and after a month of sailing it reached  $194.5 \pm 11.8$  ms. For ordinary crew members, the SAMR latent period increased in the course of the shift (work) from  $165.8 \pm 8.2$  to  $180 \pm 3$  ms (at the beginning of the voyage), while after 30 days this figure was  $189.2 \pm 7.8$  ms. Identical shifts were recorded in studying the speed of a simple visual motor reaction (SVMR)--an increase from  $175.6 \pm 10.1$  to  $222.5 \pm 12.3$  ms. The critical frequency of merging of flickering lights (CFMFL) went from  $39.0 \pm 0.9$  down to

30.8±0.8 standard units, the rate of processing information on a visual meter went from 1.48±0.05 to 1.02±0.08 bits per second, and the indicator of attention span went from 19.7±3.06 to 14.4±3.14 percent; the number of mistakes in carrying out a correction test reached 24.1±3.21.

With labor organized under the brigade method, the SAMR time for the same periods of study did not exceed 186.4±9.6 ms, the SVMR was 182.3±7.3 ms ( $P < 0.05$ ), and the CFMFL was 35.6±0.12 standard units ( $P < 0.001$ ). The rate of visual information processing went from 1.53±0.053 down to 1.27±0.09 bits per second, and at the end of the voyage it was reliably greater ( $P < 0.05$ ) than in work done under the traditional method, while the attention span was reduced from 21.6±2.86 to 18.5±3.01 percent. The number of mistakes made in carrying out a correction test with Landolt rings did not exceed 15.6±2.08 ( $P < 0.05$ ).

In studying the hemodynamic indicators at the beginning and end of the runs, changes were discovered which testify to the strain on physiological functions (the tendency for arterial pressure to be raised by 10-12 percent) and the development of fatigue (reduction of the systolic and minute volumes of circulation, increased frequency of cardiac contractions--heart rate). Under traditional labor conditions, the heart rate in operators after 1 month averaged 79.1 per minute, the systolic volume of circulation (SVC) was 60.9 ml, and the minute volume of circulation (MVC) was 4.9 l/min. For sailors and motor mechanics, the following indicators were indicated: heart rate 78.8 per minute, SVC 69.7 ml, MVC 5.3 l/min. In work under the brigade method, the heart rate for navigators and mechanics after 1 month of sailing was 10.6 percent lower, and the SVC and MVC were 18.2 and 4.1 percent higher, respectively. For the ordinary staff, the heart rate was 3.7 percent lower, and the SVC and MVC were 2.6 and 22.6 percent higher, respectively.

As for the respiratory system, for sailors working under the traditional method there was a significantly lower maximum flow rate of exhaled air in sailors and motor mechanics (9.3±1.2 l/s) and operators (10.9±1.2 l/s). The vital capacity of the lungs in forced exhaling, the volume of forcibly exhaled air in 1 second and the Tiffno indicator, and the maximum rate of exhaling and inhaling, according to pneumotachometric data, corresponded to normal. Under the brigade form of organizing labor, all these indicators turned out to be substantially lower in representatives of all professional groups of the crew, and the maximum flow rate of exhaled air was 12.4±0.9 l/s (in operators) and 13.5±0.3 l/s (in the ordinary crew), in the latter case reaching statistically significant differences ( $P < 0.02$ ).

Indicators of maximum hand strength for representatives of both groups of the crew, working under both sets of conditions in the course of sailing varied from 3 to 11 percent. When sailors worked under the traditional method, the static endurance time went from 37.3±4.3 down to 31.4±1.1 s, and the average number of contacts during 1 second during determination of static tremor increased from 1.2±0.32 to 2.6±0.24. When the brigade method was used, the static endurance time was reduced from 41.1±3.2 to 35.4±1.5 s ( $P < 0.05$ ), while the static tremor increased from 0.87±0.33 to 1.9±0.31 in 1 second.

Thus, the hygiene and physiological research carried out showed that work under the brigade method does not cause substantial changes in the indicators

characterizing ability to work and the state of physiological functions in sailors over the course of a single voyage with a duration period up to 30-35 days. The state of the higher mental functions in persons working in an operating capacity and the indicators characterizing physical ability to work in sailors whose labor consists primarily of an energetic component were higher for a crew working under the brigade method. The results of the psychological research were confirmed by subjective evaluation data from sailors on the new method of labor organization. For example, 75 percent of the crew members expressed themselves in favor of work under the brigade method, and another 15 percent had no fundamental objections to it.

In psychological research carried out after the leave and before setting sail, no signs of residual fatigue phenomena were discovered, which testified, in our view, to the adequate duration of vacation time between runs and its beneficial effect on restoring the functions disrupted during sailing. In observations on sailors who had worked under the brigade method for more than 3 years, no accumulation of signs of fatigue was discovered.

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12255

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# BRIEF

INDIFFERENCE TO PATIENTS--An article entitled "When the Diagnosis Is Indifference" was published in our newspaper on 15 February. It stated that, along with letters attesting to a sensitive and attentive attitude of many medical workers to patients, the editorial department also received complaints about rudeness and indifference to patients. For example, N. Budarov, physician at the hospital No 41 in the city of Zelenogorsk, rudely treated a patient, whom he brought in an ambulance to the hospital. L. Muryleva, medical recorder at the polyclinic No 51, groundlessly delayed sending a physician to the apartment of a seriously sick woman. V. Kamenetskaya, head of a department at the polyclinic No 87, did not take urgent measures to help a patient, who felt bad on a street near the polyclinic. G. Zaytsev, chief of the Main Administration of Health of the Executive Committee of the Leningrad Soviet, reported to the editorial department that the cases cited in the article were confirmed during a check. The article was discussed at production and trade-union meetings of collectives of treatment and preventive institutions in Leningrad and at the city conference of chief physicians. A principled evaluation was given to the negative phenomena pointed out in the article and proceedings were instituted against the guilty persons. For a violation of medical ethics N. Budarov, physician at the city hospital No 41, was sentenced to public censure. L. Muryleva, medical recorder at the polyclinic No 51, taking into consideration that she was not penalized during 15 years of work, was reprimanded. For not providing emergency medical aid on the street, V. Kamenetskaya, head of a department at the polyclinic No 87, was reprimanded severely. V. Ulikov, deputy chief physician at the medical unit of this polyclinic, was rebuked severely for the poor organization of preparedness for the provision of medical aid on the street. Rayon departments of health, persons on duty at the line-control service, and the staff of inspectors were instructed to establish strict control over the work of treatment and preventive institutions and to take specific measures ruling out the possibility of repeating similar cases. [Text] [Leningrad LENINGRADSKAYA PRAVDA in Russian 19 Apr 86 p 2] 11439

CSO: 1840/1207

UDC 614.27

ROLE OF LOCAL COMMITTEES IN DEVELOPMENT AND EXPANSION OF MATERIAL-TECHNICAL FACILITIES OF PHARMACEUTICAL NETWORK AND IN IMPROVEMENT OF DRUG SUPPLY TO RURAL POPULATION

Kiev FARMATSEVTYCHNYY ZHURNAL in Ukrainian No 5, Sep-Oct 85  
(manuscript received 18 Jul 85) pp 20-22

[Article by V. O. Dovgal, Chairman of Mezhova Rayon Council of Peoples Delegates from Dnipropetrovsk Oblast, UkSSR]

[Abstract] Migration from the country to various municipal centers led to constant decrease of the working cadres in Mezhova rayon. A network was developed, block by block, to neutralize this trend, to mobilize the inhabitants to increased activity on local level. All agreed to donate 100 hours of their free time to community projects like: memorial to the WW II heroes, memorial to Mezhova soldiers of the Pushkin Tank Army, Central Park imeni Petrovskiy, etc. Along with reconstruction of various buildings and living quarters, attention was paid to working areas of Mezhova citizens. Public health service is one of the top priorities of all new plans: new drugstores are being opened, hospitalization potential is being expanded. Analysis of the reasons for migration from the Mezhova area led to concentration of the efforts on counteracting the perceived and real difficulties.

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CSO: 1840/2236

UDC 614.27

PARTICIPATION OF AGRICULTURAL BUSINESSES IN FURTHER IMPROVEMENT OF DRUG SUPPLY TO POPULATION AT LARGE

Kiev FARMATSEVTYCHNYY ZHURNAL IN Ukrainian No 5, Sep-Oct 85  
(manuscript received 18 Jul 85) pp 22-23

[Article by V. K. Tkachenko, "Ukraina" Kolkhosp Chairman, Tomsk Rayon, Dnepropetrovsk Oblast]

[Abstract] Ukraina kolkhoz covers 12 settlements with 2.5 thousand inhabitants. Labor organization was improved in recent years but medical service lagged behind considerably; on many occasions, trips up to 20-25 km were necessary for

doctor's visits, often wasting 2-3 working days for examinations. To counteract this problem, a dispensary was built in 1982 with properly staffed, experienced medical personnel. This alone, however, did not solve the problem of easy drug supply to the patients, so eventually an apothecary was also added to the complex. Further improvements are planned for the next five-year plan.

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UDC 614.8.057:63]:313.11

#### INVESTIGATION OF PRODUCTION INJURIES AMONG RURAL POPULATION

Moscow ZDRAVOOKHRANENIYE ROSSIYSKOY FEDERATSII in Russian No 4, Apr 86  
(manuscript received 1 Jul 85) pp 31-33

[Article by T. D. Kozlova, V. L. Krasnenkov and N. A. Frolova, Department of Social Hygiene and Organization of Public Health (Head--Professor N. A. Frolova), Kalinin Medical Institute]

[Abstract] Agricultural productivity depends increasingly more on machinery and carries along with this the danger of increased production-related trauma as well as greater need for prophylactic measures. Socio-hygienic aspects of production-related trauma were studied in two rayons of Kalinin Oblast on the basis of medical records. In 1980, production trauma accounted for 42.6 cases per 1,000 individuals; 2.4 times more frequent among men than women. About 80% of the cases consisted of superficial cuts and lacerations, open wounds and broken bones. Average disability lasted from 18 to 20 days. Most accidents occurred on the way to or from work.

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UDC 614.2.003.1(049.32)

#### BOOK REVIEW: ECONOMIC EFFECTIVENESS OF HEALTH PROTECTION

Moscow ZDRAVOOKHRANENIYE ROSSIYSKOY FEDERATSII in Russian No 4, Apr 86 pp 44-45

[Review by S. Ye. Kvasov, Gorky, of book "Ekonomicheskaya Effektivnost Okhrany Zdorov'ya [Economic Effectiveness of Health Protection] by E. N. Kulagina, Volgo-Vyatskoye Publishing House, Gorky, 1984, 158 pages]

[Abstract] This monograph deals with improvement of the population's health, concentrating on economic effectiveness of government and social measures aimed at lowering morbidity and mortality. A very interesting chapter covers various forms of the influence of public health on production effectiveness. The monograph attempts to answer the question raised by K. Marx himself: is the labor of public health workers productive? E. N. Kulagina has presented some interesting calculations on the benefits of extending productive human life. Health



protection unifies social and economic effects. A special chapter is devoted to preventive measures. The book can be recommended to specialists as well as to general readers because of its wide spectrum of topics and its readable form. Unfortunately, says the reviewer, only 2,000 copies of this book were published.

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UDC 362.74(47+57.17)(049.32)

BOOK REVIEW: MAN AND PROTECTION OF HIS HEALTH IN THE NORTH

Moscow ZDRAVOOKHRANENIYE ROSSIYSKOY FEDERATSII in Russian No 4, Apr 86 pp 45-46

[Review by G. P. Ruzin, docent, Poltava, of book "Chelovek i Okrana yero Zdorovya na Severe" [Man and Protection of His Health in the North] by N. S. Yagya, P. A. Petrov, and V. S. Yagya, Meditsina, Leningrad, 1984, 216 pages]

[Abstract] The problem of far northern climate effect on the human body was treated in four chapters. The first is a historical review of medicine in the past century presented in light of tsarist expansion to the east and north. Development of Public Health in northern regions is covered in Chapter Two. Public health efforts to control tuberculosis and trachoma are documented along with statistical data concentrating on the largest geographical entity, the Yakutsk ASSR. Demographic processes were addressed in the next chapter: age and sex characteristics of northern population, birth rates, mortality, etc. The last chapter covers the ongoing changes in the system humans-nature. It addresses many problems of the north which require solution.

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CSO: 1840/2226

UDC 613/.614+616-084.3]:001.5

DEVELOPMENT OF 'SANOLOGY': SELECTED THEORETICAL ASPECTS OF STATE PROGRAM FOR HEALTH PROMOTION AND DISEASE PREVENTION

Moscow VESTNIK AKADEMII MEDITSINSKIKH NAUK SSSR in Russian No 12, Dec 85  
(manuscript received 28 Mar 85) pp 23-29

[Article by Yu. P. Lisitsyn, Moscow]

[Abstract] The term 'sanology' is proposed as a designation to cover a field of medicosocial knowledge that can most conveniently be defined as 'population health', in analogy to the fields of population psychology, genetics and biology. Basically, sanology is to deal with disease prevention and health promotion at the population level; the stimulus for the development of this branch of medical science at the interface with sociology stems from the resolutions of the 26th CPSU Congress (1983). The theoretical foundations and



practical applications of sanology deal basically with the advancement of a healthy life style, which, of course, means a socialist attitude toward personal and communal health. Properly analyzed from a dialectic materialistic and Marxist point of view, sanology seeks to analyze and define natural and social factors underlying optimal health. References 11 (Russian).

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CSO: 1840/2220

UDC 616-084.3:06.04

#### IMPROVEMENTS IN EFFICIENCY OF MASS HEALTH SCREENING IN LATVIA

Moscow VESTNIK AKADEMII MEDITSINSKIKH NAUK SSSR in Russian No 12, Dec 85  
(manuscript received 5 Feb 85) pp 37-42

[Article by V. V. Kanep, Riga]

[Abstract] As a result of the utilization of a two-stage mass health screening process (dispensarization) based on KASMON computer program, 84% of the Latvian population was screened in the first 11 months of 1984. Complete medical evaluation was performed on 75% of the population. The program resulted in the first-time diagnosis of some form of pathology in 12% of the screened population, with half of that number placed on outpatient monitoring. In view of this, by the end of 1984 the percentage of the Latvian population under outpatient care has increased by 9%, and now exceeds 600,000 individuals. The greater efficiency of the mass screening program in Latvia and the reliability of the resultant statistics are due almost exclusively to computerized data handling, including the processing of clinical laboratory data. References 15 (Russian).

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UDC 616-006.04-036.3-037-036.21-07

#### IDENTIFICATION OF POPULATION GROUPS WITH HIGH ONCOLOGICAL RISK FACTORS

Moscow VESTNIK AKADEMII MEDITSINSKIKH NAUK SSSR in Russian No 12, Dec 85  
(manuscript received 22 Feb 85) pp 60-64

[Article by Yu. Ya. Gritsman, Ye. F. Stranadko, L. V. Ten and L. V. Polyudov, Moscow Scientific Research Oncological Institute imeni P. A. Gertsen, RSFSR Ministry of Health]

[Abstract] Multiyear studies are summarized in the form of tabular data on oncological risk factors, encompassing both endogenous (body temperature, ESR, skin color, etc.) and exogenous (working conditions, habitation, etc.) factors. The data, collected over a 40-year period of some 40,000 individuals, showed

good agreement as to prognostic value in comparison with M. T. Kokonov's test (Lab. Delo, No 5: 273-277, 1965). The resultant risk indices for the various factors constitute a valuable adjunct to other data derived during mass health screening in assessing oncological risk for groups and individuals. Figures 1; References 4: 3 Russian, 1 Western.

12172/5915

CSO: 1840/2220

#### NEW DEVELOPMENTS AT HEALTH RESORTS

Frunze SOVETSKAYA KIRGIZIYA in Russian 19 Mar 86 p 4

[Article by T. Samoshina, based on interview with O. N. Narbekov, doctor of medical sciences, director of Kirghiz Scientific Research Institute of Health Resort Treatment and Physiotherapy]

[Abstract] The Kirghiz Institute of Health Resort Treatment and Physiotherapy, located as it is in an Alpine setting, has developed its own approach to health care. One of the key factors is that patients, particularly those coming from lowlands, are allowed 5 days for acclimatization and adaptation prior to the commencement of treatment. The latter relies heavily on utilizing natural resources of the Institute, such as mineral waters, mudbaths, and medicinal plants. This is not to say that drugs are neglected, but that 'natural' treatment is carried as far as possible and drugs are used in a supplementary capacity. Special attention is accorded to adolescent patients who present in a less than optimal state of health, in order to prevent more serious sequelae in later life. In addition, the Institute is concerned with identifying various sites in Kirghizia that have potential resources that could be utilized in health care, such as mineral waters and medicinal plants, and in assisting other health resorts in realizing their full potential in health care.

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#### EVALUATION OF REACTIVITY OF HEALTHY SUBJECTS IN MASS SCREENING

Moscow GIGIYENA TRUDA I PROFESSIONALNYYE ZABOLEVANIYA in Russian No 11, Nov 85 (manuscript received 8 Dec 84) pp 47-48

[Article by V. A. Kornelyuk, N. N. Klemparskaya, I. B. Isichenko, T. D. Kuzmina, A. M. Ulanova and G. A. Shalnova, Institute of Biophysics, USSR Ministry of Health, Moscow]

[Abstract] Determinations were made of blood levels of autoplague-forming cells (APFC) in 492 healthy staff members of a medical institute, to determine whether APFC can be used as a health-status indicator in mass screening. The

APFC results were correlated with the results of cardiorespiratory stress tests, on the basis of which the cohort was divided into two categories. In one group an APFC value of 5% was found to be correlated with stress test results indicative of a satisfactory state of health. In the other group an APFC value of 10% or higher was found to be correlated with a premorbid state. This preliminary observation indicates that a change in the immune system appears to be correlated with general physiological wellbeing, and that APFC determinations may be useful in mass screening to raise the index of suspicion of the examining physicians. References 7 (Russian).

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UDC 614.2:614.1:313.13+614.211+008.05:002.6(614.79)

#### MANAGEMENT OF MEDICAL INFORMATION IN RURAL RAYONS

Alma-Ata ZDRAVOOKHRANENIYE KAZAKHSTANA in Russian No 4, Apr 86 pp 11-13

[Article by M. M. Kozybayeva, All-Union Scientific Research Institute of Social Hygiene and Public Health Administration imeni N. A. Semashko]

[Abstract] An analysis was conducted of the various methods employed in rural rayons in the management of medical information, based on the data collected from clinics, hospitals, and other medical facilities. Basically, the collection and processing of medical statistics followed one of three patterns: centralized, decentralized, and mixed form. On the whole, the centralized form was found to be most efficient, allowing the statisticians and information experts considerable time for educational and analytical activities in comparison with collating tasks. However, there is room for the alternative forms depending on the local circumstances, as demonstrated in a number of oblasts in Kazakhstan. The centralized forms of rural medical statistics handling are most efficiently conducted in Ukraine and Latvia, which can serve as patterns to be emulated elsewhere.

12172/5915

CSO: 1840/2233

## CURRENT CHALLENGES IN PREVENTIVE OCCUPATIONAL MEDICINE

Kazan KAZANSKIY MEDITSINSKIY ZHURNAL in Russian Vol 66, No 4, Apr 85  
(manuscript received 29 Apr 85) pp 248-251

[Article by I. G. Nizamov, Chair of Social Hygiene and Public Health Administration, Kazan Institute for the Advanced Training of Physicians imeni V. I. Lenin]

[Abstract] A computer-based analysis was conducted on the morbidity patterns in Tatar ASSR and sick leave statistics, in order to define particular at-risk groups and formulate appropriate preventive measures. The statistics for the period 1958-1983 demonstrated that 82.1% of all the morbidity of the industrial and agricultural workers was due to disorders of the respiratory organs, nervous system, circulatory system, digestive organs, and the skin. Such cases generated 70.2% of all the sick-leave days. In the special case of the farm workers, traumatism accounted for 13% of the sick leave, coming in third after respiratory and gastrointestinal problems. Age-factor analysis revealed that the 35-39 year group had the highest incidence of morbidity and sick leave (exceeding by ca. 2.3-fold that in the 30-34 year group). This appeared to be due to the special predisposition of this age group to cardiovascular, neuro-psychiatric, musculoskeletal and connective tissue disorders. In view of this, it appears imperative that mass screening programs provide age-morbidity data for further analysis, and that the 35-39 year old group receive special attention in view of its importance in the workforce. References 5 (Russian).

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CSO: 1840/2209

## COST EFFECTIVENESS IN MEDICINE

Moscow MOSKOVSKAYA PRAVDA in Russian 2 Apr 86 p 2

[Article by V. Chissov, professor and director, Moscow Scientific Research Oncology Institute imeni P. A. Gertsen (Herzen)]

[Abstract] There is an acute need for cost-effectiveness controls in Soviet medicine, in order to clamp a lid on self-serving and often useless 'research'. In many cases the so-called studies and investigations that are being conducted at the various research institutes are simply designed to provide an excuse for a dissertation, with no or minimal benefit to Soviet society. One area in which considerable and telling improvements could be made would be creation of specialized diagnostic institutes staffed with experts and equipped with the latest in medical technology. Another approach is better-organized outpatient service to care for the needs of a wide variety of patients, with hospitalization limited to specialized clinics. Finally, salaries should be based on experience, expertise, responsibilities, qualifications and accomplishments. Uniform salaries for physicians without regard to these factors is not only poor economics, but also contrary to the principles of socialism.

12172/5915

CSO: 1840/1215

## DEVELOPING SCIENTIFIC RESEARCH SKILLS IN MEDICAL STUDENTS

Tbilisi MOLODEZH GRUZII in Russian 12 Apr 86 p 4

[Article by I. Kuparadze, based on interview with V. I. Ilyin, prorector of the 1st Moscow Medical Institute and deputy chairman, Medical Section, All-Union Council on Scientific Research Work of Students, USSR Ministry of Higher Educational Institutions]

[Abstract] Statistics show that approximately 66% of the medical students in the USSR are engaged in scientific research, but a careful scrutiny of such figures shows that there is considerable room for improvement. At many medical institutes, such research is merely done to complement the work of established senior investigators with little intellectual input by the students. In many other cases, such efforts receive only half-hearted support and suffer from lack of adequate financial and material resources. The medical establishment needs to pattern itself more on the traditions of the various other branches of science, where research is combined with practical applications and the students are involved in a project from its beginning to on-site application of the results. Such an approach would impart healthy work habits and intellectual curiosity to medical students and result in graduating more motivated physicians.

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CSO: 1840/1212

## COLLAPSE OF MEDICAL ETHICS?

Tbilisi MOLODEZH GRUZII in Russian 8 Apr 86 p 2

[Article by M. Urushadze, secretary of the Party Committee, (Georgian) Republic Clinical Hospital]

[Abstract] This is a first-person public acknowledgement of the author's poor work performance. In October of last year the author was issued a reprimand by the Saburtalinsk Rayon Party Bureau in connection with the goings-on at the Republic Clinical Hospital. He admits that as secretary of the Party Committee at the hospital he had failed to detect corrupt practices, one of which consisted of issuing a certificate attesting to two years of service in a surgical clinic to an individual that had served only two months. This and other similar cases have resulted in the dismissal of a number of individuals from the hospital, and yet his fault and shame lie in the fact that he was too trusting and easily manipulated by people perceived as his friends. The reprimand led him to conclude that only through open discussions and constant alertness to any shortcoming in medical ethics will we meet the obligations and responsibilities placed on us by the resolutions of the 27th CPSU Party Congress and the 27th Party Congress of the Georgian Communist Party.

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CSO: 1840/1210

## PATIENTS' RESPONSIBILITY TOWARD MEDICAL ETHICS

Tbilisi MOLODEZH GRUZII in Russian 8 Apr 86 p 2

[Article by A. Bordzhadze, chief physician, 1st Tbilisi Municipal Hospital, candidate of medical sciences]

[Abstract] Much of the talk about medical ethics neglects to mention the key role played in such situations by the patients themselves and their relatives. After all, physicians are only human. Sooner or later deliberately or inadvertently a physician may accept a gift or some other form of gratuity. Such behavior inevitably leads to loss of self-esteem as well as to a derisive attitude on the part of the general public toward medical practitioners. However, it is also the responsibility of the patients and their relatives to behave in a manner that does not create an embarrassing or uncomfortable position for the physicians. A sincere 'thank you' is the best gift that any physician would want and appreciate.

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## RESPONSE TO ARTICLE ON MEDICAL MALFEASANCE

Tashkent PRAVDA VOSTOKA in Russian 12 Apr 86 p 3

[Article by A. Tankhelson]

[Abstract] The article entitled "Medical Malfeasance" in the January 23, 1986 issue of PRAVDA VOSTOKA evoked a number of responses from the readers, including the Uzbek SSR Ministry of Health and physicians representing 207 medical institutions in Tashkent. Basically, all recognize that among the good and conscientious physicians are some that do not meet the high standards of medical ethics, and that they should be removed from the profession. Any behavior that is not in accordance with medical ethics will not be tolerated, and the Uzbek SSR Ministry of Health has taken steps to implement strict oversight control of the various medical establishments. Physicians from various institutions have demanded that the degrees of physicians guilty of malfeasance be revoked, while the general public has shown considerable degree of social maturity by recognizing the complexity of the issue and differentiating between ethical and unethical behavior on the part of physicians.

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CSO: 1840/1216

## MEDICAL CARE IN MOSCOW

Moscow MOSKOVSKAYA PRAVDA in Russian 29 Mar 86 p 2

[Article by V. Yegikova, based on interview with V. A. Koroleva, deputy chairman, Moscow Soviet Executive Committee]

[Abstract] That all is not well with medical care in Moscow has been widely recognized and admitted by the medical establishment, which has been subjected to sharp criticism at the 26th City Party Conference. The problem lies partly in the shortage of some 2000 medical specialists in the city, as well as in nurses and allied health personnel. There is also shortage of medical equipment and supplies at the polyclinics and hospitals in Moscow. Despite the increase in number of patient beds, repairs and renovations are lagging behind schedules, and construction of much needed new medical facilities is virtually at a standstill because of the low priority accorded to medical buildings by the construction industry. Despite the best efforts of the city administration the resources available in Moscow itself are inadequate to assure the type of development of medical care that is the right of Soviet citizens. It is obvious that help will have to come from the appropriate Soviet ministries to alleviate present problems and insure future development of efficient medical care in Moscow.

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CSO: 1840/1220

## DECENTRALIZATION OF MEDICAL EXPERTISE IN KAZAKHSTAN

Alma-Ata KAZAKHSTANSKAYA PRAVDA in Russian 12 Apr 86 p 4

[Article by T. Kvyatkovskaya, correspondent]

[Abstract] All too often patients requiring specialized surgical assistance in Kazakhstan either must go to Alma Ata, or a specialist has to be flown to them from the Scientific Research Institute of Clinical and Experimental Surgery imeni A. N. Syzganov. Despite all the effort that has been made in information transfer from the Institute to the outlying areas in terms of new developments and advancements, complicated cases are still referred to the Institute by the local surgeons. Teams of surgeons from the Institute have organized and given theoretical and practical courses in the newer surgical techniques at various localities, and many surgeons from the distant areas have received postgraduate training at the Institute. Part of the problem appears to be psychological: inertia in the face of the new, fear of assuming responsibilities, and lack of self-confidence. Another factor is that difficult surgical operations require equipment and supplies that are on par with the surgical technique, and which frequently are lacking in outlying areas. All of these problems must be addressed in a comprehensive manner, and perhaps one of the answers would be to create additional specialized medical centers at the oblast level. The establishment of such regional centers can be expected to accelerate the rate at which physicians in the outlying areas would acquire surgical expertise.

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## USE OF DISCRIMINANT ANALYSIS IN DISPENSARIZATION

Moscow TERAPEVTICHESKIY ARKHIV in Russian Vol 58, No 2, Feb 86  
(manuscript received 14 May 85) pp 128-129

[Article by N. S. Petrov and A. A. Novik, Military-Medical Academy imeni  
S. M. Kirov, Leningrad]

[Abstract] A study was made of 300 persons in a production team exposed to low intensity chemical factors over a long period of time (years). Complex multi-factor analysis was undertaken considering case history, physical, laboratory and instrumental data, all of which were processed on a Ye.S.-20 computer by discriminant analysis. As a result, the workers were divided into four groups: healthy persons, practically healthy persons with slight changes in nonspecific immunity, morphological and functional properties of the blood cells, practically healthy persons with unidirectional hematologic and immunologic changes showing a tendency toward hypofunction, and persons with diseases of the internal organs. The levels of erythrocytes, hemoglobin, leukocytes, glycogen, peroxidase, acid and alkaline phosphatase in the peripheral blood, phagocytic index and phagocytic capacity of the blood were found to be informative. It is suggested that this method of semiautomatic estimation of the status of health be broadly used in dispensarization observation of the population to detect premorbid states before clinical manifestation of disease.

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## PARTICIPATION OF STUDENTS IN DISPENSARIZATION OF POPULATION

Moscow TERAPEVTICHESKIY ARKHIV in Russian Vol 58, No 2, Feb 86  
(manuscript received 19 Feb 85) pp 134-135

[Article by A. A. Stupnitskiy and V. S. Predtechenskaya, Department of Therapy,  
Headed by Professor A. A. Stupnitskiy, Voronezh Medical Institute imeni  
N. N. Burdenko]

[Abstract] Fourth-year medical students assisted in dispensarization examinations of the population under the leadership of physicians. Workers were examined in factories, state and collective farms, schools and technical schools. Particular attention was given to patients with rheumatism, high blood pressure, heart disease and ulcers. Acute respiratory disease, pneumonia and infectious-allergic myocarditis were occasionally found during examinations. The summer's work showed that the use of upper level students for dispensarization of the population is useful both for the work performed and for the education of the students. Reference: 1 Russian.

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CSO: 1840/2135



## EXPERIENCE IN ORGANIZING DISPENSARIZATION OF CHILDREN WITH ENT PROBLEMS

Kiev ZHURNAL USHNYKH, NOSOVYKH I GORLOVYKH BOLEZNEY in Russian No 2, Mar-Apr 86  
(manuscript received 5 May 85) pp 70-72

[Article by I. P. Sizyy, Otolaryngological Division (Chief: V. N. Shevchuk),  
Chernigov Oblast Children's Hospital (Chief Physician: I. F. Morgun)]

[Abstract] Dispensarization--mass medical examination of the population--is a complex set of prophylactic, therapeutic, social and curative measures directed at protection and improvement of children's (and adults) health, all-around development of their strength, prevention and early detection of diseases. The question remains open how many patients can a physician see within a massive, comprehensive screening mode. The author claims that 400-700 examinations annually is not unreasonable. A case was made for inclusion of technical and paramedical personnel in some screening activities. All physicians should partake in such operations, not just those from outpatient clinics. In 1962, when massive screening programs began, the incidence of ENT diseases was 313.8/1,000; in 1984 it dropped to 153.5/1,000. Similar trends were observed with other diseases. References 11 (Russian).

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CHRONOPHYSIOLOGICAL STUDY OF ALCOHOL EFFECT ON CARDIOVASCULAR SYSTEM  
OF HEALTHY INDIVIDUALS

Moscow KARDIOLOGIYA in Russian Vol 26, No 4, Apr 86  
(manuscript received 3 Jun 85) pp 60-64

[Article by V. P. Latenkov, Department of Biology (Chairman G. D. Gubin),  
Tyumen Medical Institute]

[Abstract] Effect of a single dose of alcohol on the circadian rhythm of the cardiovascular system of healthy individuals was studied on 30 volunteers, 21-26 years old, given a single dose of alcohol which produced alcohol blood levels of  $1.87 \pm 0.03$  g/l. During the period preceding alcohol intake, a definite circadian rhythm of the cardiovascular system was established which was immediately disrupted after consumption of alcohol. Alcohol affected different hemodynamic indices under study in different ways. Most of the affected parameters returned to normal levels after alcohol elimination from the body (about 13-15 hrs). In isolated cases this process lasted longer. Full circadian rhythm was reestablished within three days after alcohol intake. References 25: 16 Russian, 9 Western.

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CSO: 1840/2273

PSYCHIATRY

UDC 616.89-008.441.13-08-039.71-039.33

CLINICO-PSYCHOPATHOLOGICAL CHARACTERISTICS OF PROLONGED REMISSIONS IN  
CHRONIC ALCOHOLICS

Kazan KAZANSKIY MEDITSINSKIY ZHURNAL in Russian Vol 66, No 4, Apr 85  
(manuscript received 4 Feb 85) pp 282-283

[Article by L. K. Shaydukova, Chair of Psychiatry, Kazan Order of the Red  
Banner of Labor Medical Institute imeni S. V. Kurashov]

[Abstract] Clinical psychological testing was conducted on 268 chronic  
alcoholics of a 346 cohort under observation to determine neuropsychiatric  
characteristics in the course of a prolonged remission. The patients had been  
in remission for over 3 years at the time of initial testing and were divided  
into normal, borderline and ill categories. The latter were further subdivided  
on the basis of the severity of the neuropsychiatric disorders. The results of  
the testing procedures were in general agreement with the catamnestic data on  
their mental state, and indicated that in remission the mental state of the  
patients remained at the previous functional level. References 3 (Russian).

12171/5915

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## RADIATION BIOLOGY

### TREATMENT OF RADIATION SICKNESS IN CHERNOBYL ACCIDENT VICTIMS

Moscow MEDITSINSKAYA GAZETA in Russian No 43, 28 May 86 p 2

[Article by E. Gorbunova, science commentator]

[Excerpt] Here are statistics on the consequences of the accident at the nuclear power station in Chernobyl. During the first hours, two employees who were in one of the station's buildings were killed on the night of April 25-26. Exposed to radiation were 204 persons who were on duty at the station or who fought the fire that broke out; they were transported immediately to special clinics. A week later, one patient had died and 17 were in serious condition. According to data for May 15, 299 persons had been hospitalized with a diagnosis of radiation sickness of different degrees of severity; seven had died, and 35 were in serious condition. I asked Andrey Ivanovich Vorob'yev, corresponding member of the USSR Academy of Medical Sciences: "Is the danger to the patients' lives increasing?" He replied:

"Radiation sickness has its own cycles of progression. The smaller the dose of radiation absorbed, the later do symptoms of it occur (if they occur). Destruction of the bone marrow is the principal symptom.

"When it is reported that a patient is in serious condition, this means that the acute period of the illness--destruction of the bone marrow--has been diagnosed. The patient's condition may return to normal in a week or two. Information on the condition of patients, which accurately reflects the existing situation, changes day by day."

"American specialists, particularly professors Gale and Terasaki, have arrived in Moscow. What necessitated this?"

"Under ordinary circumstances, physicians around the world do not usually resort to bone-marrow transplants; there are many unsolved problems here. It has now become necessary to transplant marrow to many patients at once. Every physician realizes how difficult this is even from the technical standpoint, and it is not surprising that colleagues in different countries offered to help us overcome these difficulties. Colleagues not only from the United States but from France, Japan and Italy as well offered to help.

"Professor Gale is a leading U.S. specialist in bone-marrow transplantation. Professor Terasaki is the author of original methods of determining the degree of compatibility of bone-marrow tissue. Nineteen patients who needed marrow transplants have received them."

"Work on eliminating the consequences of the accident is in progress in the area of the Chernobyl nuclear station and even at the station itself. In particular, helicopter pilots have made hundreds of flights over the damaged building of the station, capping the reactor with a kind of cushion made of various substances. Could these pilots develop radiation sickness?"

"There should be no such cases; the amount of time that people spend in the zone of high radioactivity is strictly regulated. After working there, everyone (not just helicopter pilots) undergoes preventive treatment which strengthens the body."

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SUSCEPTIBILITY OF HUMAN LYMPHOCYTE CHROMOSOMES TO RADIATION DAMAGE BY 6 MeV  
FAST ELECTRONS IN RELATION TO MITOTIC CYCLE

Kiev TSITOLOGIYA I GENETIKA in Russian Vol 19, No 4, Jul-Aug 1985  
(manuscript received 23 Jan 84) pp 260-263

[Article by Ye. Ye. Chebotarev and E. A. Seredenko, Institute of Oncological  
Problems, Ukrainian SSR Academy of Sciences, Kiev]

[Abstract] Comparative studies were conducted on chromosomal damage induced by 6 MeV fast neutrons and gamma-irradiation in cultured human lymphocytes in different mitotic stages. Exposure of the culture to gamma-rays from a Co-60 source (0.5 Gy/min; 0.25-4.0 Gy) or the fast neutrons (less than 10% gamma-component; 0.25-2.0 Gy) yielded qualitatively similar results. Highest radiosensitivity was seen in the  $G_1$  and  $G_2$  phases, and the least damage was obtained in the S phase. With an increase in the dose, the neutrons induced the highest increase in chromosomal aberrations in the  $G_2$  phase, and gamma-irradiation in the  $G_1$  phase. However, the damage yield with the fast neutrons was generally lower than with the gamma-radiation. In the  $G_0$  and  $G_1$  phases fast neutrons tend to induce more chromatid-type abnormalities than does gamma-radiation, whereas in the later phases fast neutron irradiation induces more chromosomal abnormalities than seen with gamma-irradiation. These findings demonstrated that the genetic repair mechanism functions most efficiently in the S phase (replicative synthesis of DNA) in overcoming the damaging effects of both types of ionizing radiation. Figures 4; references 9: 7 Russian, 2 Western.

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## CONFERENCES

### FIRST CONGRESS OF SOCIALIST BLOCK PSYCHIATRISTS IN MOSCOW

Moscow SUDEBNO-MEDITSINSKAYA EKSPERTIZA in Russian No 2, Apr-Jun 86 p 64

[Report by Prof. B. V. Shostakovich and V. Ye. Pelipas: "First Congress of Psychiatrists from Countries of Socialist Friendship"]

[Text] The First Congress of Psychiatrists from Countries of Socialist Friendship took place in Moscow on 25-27 September 1985. The congress was convened at the initiative of the governing board of the All-Union Scientific Society of Neuropathologists and Psychiatrists. Participants in the congress included representatives of scientific psychiatric societies in PRB, HPR, SRV, GDR, KPDR, MPR, PPR, SRR, USSR, and CSSR. At 3 plenary and 5 sectional meetings, more than 100 papers were heard on current problems of psychiatry and narcology. Particular attention was given to questions of the organization of scientific collaboration among psychiatrists from countries of socialist friendship (Academicians of the Academy of Medical Sciences, USSR G. V. Morozov and A. V. Snezhnevskiy, corresponding members of the AMS M. Ye. Vartanyan and R. A. Nadzharov, Professors Ya. Mechirzh and Ya. Gebkhardt, CSSR, and B. Nikel, GDR), and to the methodology of joint research in psychiatry (Corresponding Member of the AMS, USSR N. M. Zharikov et al., USSR).

Problems of narcology occupied a central place in the work of the congress. They were discussed at one plenary and two sectional meetings (24 reports). B. V. Morozov, a representative of the governing board of the All-Union Scientific Society of Neuropathologists and Psychiatrists of the AMS, USSR delivered a program paper on the current state and future prospects of scientific research devoted to the problem of alcoholism. The aims of modern narcology were elucidated by Candidate of Medical Sciences E. A. Babayan. Presentations at the congress represented the wide range of basic research trends in narcology: the social aspect of alcoholism (Prof. Ya. Szilard, HPR, Professors I. Valde, A. Piatorski, and V. Mochulski, and K. Malek, PPR), its medical and biological aspects (Corresponding Member of the AMN, USSR I. P. Anokhina, Prof. P. V. Voloshin et al., Prof. L. F. Panchenko, N. A. Belyayev, Doctor of Medical Sciences N. I. Kuznetsova et al., Yu. V. Burov, and A. Ye. Bobrov, USSR), questions of early diagnosis (Prof. G. Richter, GDR, Prof. N. N. Ivanets et al., Prof. V. F. Matveyev, and G. P. Kolupayev, USSR), and the clinic's problems with the pathogenesis of chronic alcoholism and alcoholic psychosis (Professors V. Haas and B. Nikel, GDR; Prof. P. G. Smetannikov, Kh. A. Gasanov et al., Prof. A. K. Kachayev, and Doctor of Medical Sciences

V. B. Altshuler, USSR). A number of papers were devoted to questions of the treatment and prevention of alcoholism and alcoholic psychosis (Prof. Ya. Mechirzh, I. Marechek, Ye. Ventsovskiy, and M. Kolomatskin, CSSR; Prof. M. G. Gulyamov and Doctor of Medical Sciences I. V. Boki, USSR).

A large place in the congress's work was occupied by the discussion of problems of forensic psychiatry. At this section, participants heard 16 reports dedicated basically to questions of the motivation, formation, and realization of socially harmful tendencies which arise in the mentally ill and in persons with mental deviations, as well as to ways for their prevention (Prof. T. P. Pechernikova, V. V. Guldin, Professors Yu. A. Ilinskiy, V. P. Belov, F. V. Kondratyev, Prof. K. L. Immerman and co-author, G. M. Rumyantseva, and G. N. Milekhin, USSR). A report devoted to the same topic was presented by Prof. P. Donchev (PRB), well-known for his development of a typology of the psychopathological motivation for dangerous behavior of the mentally ill. Appreciable attention was allotted as well to the forensic psychiatric appraisal of the underaged and to the prevention of delinquent behavior in adolescents (Prof. A. Y. Lichko, Doctor of Medical Sciences V. A. Guryeva, Doctor of Medical Sciences E. S. Natalevich and co-author, USSR). In addition, papers were presented of a theoretical nature which touched upon forensic psychiatric aspects of problems of responsibility under various psychopathological conditions (Prof. V. P. Kotov, M. M. Maleseva, Doctor of Medical Sciences I. A. Kudryavtsev, and L. A. Podrezova, USSR) and modern concepts about the interrelation of psychogens and the soil (Prof. B. V. Shostakovich et al., USSR).

All the papers were attended with great interest and engendered lively discussions. The materials of the congress will be published.

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SEVENTH CONVENTION OF ALL-UNION MICROBIOLOGICAL SOCIETY (ALMA-ATA, 22-29 JUN 85)

Ashkhabad IZVESTIYA AKADEMII NAUK TURKMENSKOY SSR: SERIYA BIOLOGICHESKIKH NAUK in Russian No 6, Nov-Dec 85 (manuscript received 23 Jul 85) pp 75-76

[Article by E. I. Gorina, V. P. Zhuravleva, O. S. Lyubetskaya, Kh. N. Orazov and R. S. Sakhatov, Botanical Institute, TSSR Academy of Sciences, Institute of Soil Science, TSSR Ministry of Agriculture]

[Abstract] The first paper was presented by M. V. Ivanov on "Contribution of Microbiology to Present Biotechnology," followed by V. Ye. Matveyev on "Development of Microbiological Industry in Light of the Goals of the Party's Economic Politics". N. S. Yegorov addressed the issue of improved qualifications for lectures in microbiology and A. N. Ilyaletdinova concentrated on the subject of microbiology in the service of environmental protection. A number of symposia and poster sessions were held on the following topics: systematization of microorganisms; new forms and collections of cultures; physiology, biochemistry and organization of microorganisms; genetics and genetic engineering; biotechnological principles of microbiological syntheses; plant and microbial viruses; ecology, geochemical activity of microorganisms and environmental protection; agricultural microbiology. Academician G. K. Skryabin was elected as the new President of All-Union Microbiological Society. The next convention will be held in Leningrad in 1990.

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## MISCELLANEOUS

### BIOLOGICAL RESEARCH AT LENINGRAD NUCLEAR PHYSICS INSTITUTE

Moscow PROBLEMY I RESHENIYA in Russian No 8, 22 Apr 86-5 May 86 pp 1-3, 6

[Excerpt] The Leningrad Research Center (LNTs) of the USSR Academy of Sciences was established in 1983. Today it consists of 53 organizations, including 32 scientific institutions. They employ more than 20,000 persons, among whom there are 16 academicians, 29 corresponding members of the academy, and more than 700 doctors of sciences and about 3,000 candidates of sciences. In addition to this, Leningrad has over 40 higher educational institutions and several hundred industry research organizations where thousands of doctors of sciences and tens of thousands of candidates of sciences work. Uniting their efforts, LNTs is exercising scientific-methodological guidance for carrying out of the comprehensive program "Intensifikatsiya-90".

On April 8, 1986, there was a meeting of the presidium of LNTs. The topic of an address by Academician I. A. Glebov, chairman of the presidium and an eminent specialist in power machine building, was the tasks of institutions of the Leningrad center in the light of the decisions of the 27th Congress of the Communist Party of the Soviet Union.

After a recess in the meeting, the participants focused attention on the prospects for advancement of biological research at the Leningrad Institute of Nuclear Physics imeni Konstantinov.

Molecular and physical-chemical biology is the application of the methodology and methods of physics to biological objects and processes. This was the point made by Candidate of Physical-Mathematical Sciences V. N. Fomichev, head of the laboratory of molecular and radiation biophysics (LMRB) of the USSR Academy of Sciences' Leningrad Institute of Nuclear Physics.

The laboratory makes broad use of all kinds of modern physics equipment: lasers, reactors, computer technology. This makes it possible to create experimental units and to conduct research on the highest level of quality. At the same time, the ties of specialists of the LMRB with biologists and their representation in scientific councils of biological specialties are still insufficient, in the opinion of participants in the meeting.

After the meeting we asked Viktor Nikolayevich Fomichev to tell us about the most interesting developments of the LMRB. He invited us instead to visit the laboratory in Gatchina to learn about them first hand.

Of the many types of research being conducted at the laboratory, we chose three to look at: identification of viruses with the aid of laser correlation spectroscopy, channel cytofluorometry, and new methods of petroleum and gas purification.

Scientists at the laboratory decided to employ computerized processing of spectra of scattered light for the study of blood components. It was found that in blood serum of healthy persons, there are no particles that are between 100 and 1,000 angstroms in size. At the same time, the majority of infectious viruses are of precisely this size. This opened the enticing prospect of establishing the size of particular viruses and then making a quick diagnosis of the diseases that they cause. Experiments were conducted with hepatitis pathogens (it was learned how to detect them reliably in three to five minutes), and then similar successes were achieved with other biological objects.

Radioprotectors--substances that protect an organism against radiation--often contain sulfur-containing groups that neutralize active chemical radicals which appear in the course of irradiation. Compounds of this kind worsen the quality of organic fuels. Associates of the LMRB decided to get rid of sulfur-containing impurities with the aid of... other sulfur-containing impurities. It was found that aminomercaptans were suitable for this: one kilogram of them proved sufficient for purifying 10,000 tons of petroleum products. An original method also was proposed for purifying natural gas with the aid of iodine-containing complexes.

(Ten photographs are given showing a number of participants in the meeting of LNTs' presidium, and associates of the LMRB at work.)

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## ASPIRATOR DEVICE FOR TAKING AEROSOL SAMPLES IN MOTOR VEHICLES

Moscow GIGIYENA I SANITARIYA in Russian No 12, Dec 85  
(manuscript received 29 Dec 84) pp 52-53

[Article by R. Ya. Maslovskiy]

[Text] On loading, transporting and unloading of solid wastes of industrial plants, connected usually with dust formation, toxic aerosols can possibly enter into the interior of motor vehicles, hence, they can affect the drivers and the accompanying personnel involved. In order to assess the possible danger of the effect of aerosols on the persons of this group, the air pollution must be controlled in the interior of the vehicles. This control must be carried out by using appropriate aspirators which ensure sample taking.

Such a device was described earlier by us. (Footnote 1) (Gigiyena i sanitariya, No 1, 1974 p 101) In addition to advantages, it has many shortcomings, such as complicated conversion of the electric circuit diagram of the electric vacuum cleaner (dust collector) from 220 to 12 V, the relatively large size and weight of the device, which render its use difficult, as well as the relatively high price of the device due to the application of a vacuum cleaner (dust collector).

Taking all this into consideration, by using the turboelectric motor, from the heater of the vehicle, an aspirator device is installed, which is operated by a 12 V current from the vehicle-borne supply line of the motor vehicle (see Figure) [photo not reproduced]. Practically, it consists of a ready-made unit composed of an electric motor and a turbine from the car heater. A funnel-shaped filter holder, having a bell-mouth of maximum 200 mm in diameter, is attached to the inlet opening of the heater. The bell-mouth is closed by a metal grid, which carries a round FFP-cloth filter. The filter is retained against the edges of the grid by means of a circular metal collar. The turboelectric motor is installed on the rest of the platform, to the bottom side of which two round magnets are attached. By means of these two magnets, the device is safely retained on the metal surfaces of the interior of the vehicle.

The capacity of the device is up to 19 cu.cm/hour; the rate of air penetration through 1 sq. centimeter of FFP cloth is up to 0.13 liter/min. The device is simple to make, reliable and convenient in operation, is small in size, and is much less expensive than the device made with an electric vacuum cleaner. It can be used also for controlling air pollution by aerosols in work areas of different industrial plants.

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# BRIEF

USSR, GDR MEDICAL COOPERATION--the 27th session of the permanent working group of USSR and GDR ministries of health ended with the signing of a protocol on cooperation for 1986 in Kiev. Its participants summed up the work during 5 years and determined the subjects and long-term directions in joint research. GDR specialists became acquainted with the activity of a number of medical institutions and scientific research institutes in the capital of the Ukraine. During a trip to Brovarskiy Rayon they became interested in the organization of rural public health. Speaking during the protocol signing ceremony, O. P. Shchepin, USSR first deputy minister of health, noted that cooperation between specialists in the field of public health in the two fraternal countries became traditional and brought good practical results. He stressed that, undoubtedly, the debates held in Kiev and the exchange of information on achievements in a number of key branches of medical science and practice would promote an accelerated solution of problems of improvement in the public health system put forward in the decisions of the 27th CPSU Congress and in the pre-congress documents of the forthcoming 11th Congress of the Socialist Unity Party of Germany. "This session," R. Muller, GDR deputy minister of health, said in a conversation with a RATAU [Ukrainian News Agency] correspondent, "has an important feature: The proposals developed during its course will promote a higher qualitative level of cooperation in the area of advanced methods of treatment of cardiovascular, oncological, infectious, and other diseases. More attention is to be paid to labor hygiene. Having become acquainted with public health in the Ukrainian SSR, we have become convinced of its high level. A mutual desire for the concretization of cooperation was expressed during a visit to Kiev's scientific research institutions. I am confident that we will establish direct, new contacts in the very near future." A. Ye. Romanenko, UkSSR minister of health, and Z. Heldtke, consul-general of the GDR in Kiev, were present during the signing of the protocol. [Text] [Kiev PRAVDA UKRAINY in Russian 4 Apr 86 p 3] 11439/5915

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## MINIATURE COUNTER FOR MICROBIAL COLONIES

Moscow MIKROBIOLOGICHESKAYA PROMYSHLENNOST: EKSPRESS-INFORMATSIYA in Russian  
No 1, Jan 86 pp 6-8

[Synopsis by I. S. Bulatov of an industrial brochure issued by the All-Union Scientific Research Institute of Applied Microbiology]

[Abstract] Cursory description is provided of a microbial colony counter, that can be used either on open or covered Petri dishes. The entire apparatus is a small unit (145 x 24 x 18 mm) consisting of a signal transformer, an electronic counter with digital readout, and a sound generator. The probe can either be used on the colonies directly to provide a visual record of colonies that have been touched, or they can be followed on Petri dish covers by affixing a writing element to the probe. In addition to the digital readout a sound signal is generated to allow for auditory control of the counting process. The unit is expected to go into mass production in 1987 and to cost 260 rubles. Further information can be obtained from the All-Union Scientific Research Institute of Applied Microbiology, Obolensk, Serpukhov Rayon, Moscow Oblast 142279.

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UDC 612.8

## CONTROLLING BIRD BEHAVIOR: BIOACOUSTIC REPELLANTS AND STIMULANTS

Moscow VESTNIK AKADEMII NAUK SSSR in Russian No 3, Mar 86 pp 55-61

[Article by V. D. Ilyichev, doctor of biological sciences]

[Abstract] Humans impact on birds and birds impact on man in a variety of situations, ranging from airplane-bird collision to avian consumption of grain and other crops of value to man. Outside of poultry and the esthetic pleasures man derives from observing birds in nature and in captivity, man is either indifferent or ignorant of the role of birds in various ecosystems. However, more recently the role of birds in controlling insect pests has gained more appreciation, and justifiable alarm has been generated at the disappearance of a number of species due to anthropogenic factors. In order to protect birds

and utilize them in the service of man, bioacoustic control methods have been developed in the USSR, the country which claims priority in this type of research and its applications. Such bioacoustic signals are used in a variety of settings to control bird behavior, ranging from frightening them away from crop fields to initiating hatching behavior. A new generation of sound synthesizers is being used to more closely approximate the acoustic features of a target species of birds, and, as a consequence, to ensure better behavioral control. The leading institute in the USSR in that type of research since 1973 has been the Institute of Evolutionary Morphology and Ecology of Animals imeni A. N. Severtsov of the USSR Academy of Sciences. References 5 (Russian).

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CSO: 1840/1221

UDC 615.472.03:616.5-089.843

#### DERMATOME FOR PREPARING ACCORDION GRAFTS

Moscow KHIRURGIYA in Russian No 5, May 85 (manuscript received 4 May 84)  
pp 124-126

[Article by M. I. Kuzin, professor, and D. A. Donetskiy, candidate of medical sciences, Institute of Surgery imeni A. V. Vishnevskiy, Moscow]

[Abstract] Technical details are presented on modifications introduced into the Zimmer dermatome for preparing accordion grafts, in order to prevent dulling of the knife and damage to the roller. The modified apparatus, designated No 9255333, utilizes stainless steel shaving blades (Leningrad or Voskhod) and a retaining roller made of polyethylene, polyvinyl chloride or a fluoroplastic to allow sterilization at high temperatures. The modified Zimmer instrument has been used extensively at the Institute of Surgery for the preparation of accordion autografts, as well as in the large-scale production of porcine accordion xenografts. Figures 1; references 7: 3 Russian, 4 Western.

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UDC 340.661:629.73].616-073.585

#### PHOTOGRAPHIC INVESTIGATIONS AT AIR DISASTER SITES AND THEIR VALUE IN SOLVING FORENSIC MEDICAL PROBLEMS

Moscow SUDEBNO-MEDITSINSKAYA EKSPERTIZA in Russian No 2, Apr-Jun 86  
(manuscript received 8 May 85) pp 41-43

[Article by I. M. Alpatov, Moscow]

[Abstract] Photographic investigations represent an important component of the investigation of accidents, especially of air disasters. Yet, there is little material in professional literature concerning this subject. There are

four types of photography used in air accidents: orientational photography (general scenery taken from air and showing the possibly last view of the ground by the pilot), survey (covering the accident site and the path of flight from the first detail to the last) objective and detail photography (the last two concern the air crash victims: their surroundings, positioning, burns, clothing, etc). Correct photography assists in establishing the necessary background for the accident. It helps the forensic medical personnel and the technical representatives. References 5: 4 Russian, 1 Western.

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UDC 543.545+612.82

#### MICROIONTOPHORETIC DEVICE WITH INBUILT AMMETER, TIMER AND TIME MARKER

Moscow ZHURNAL VYSSHEY NERVNOY DEYATELNOSTI in Russian Vol 34, No 2,  
Mar-Apr 86 (manuscript received 16 Apr 85) pp 403-406

[Article by Ye. A. Kiyatkin, V. O. Kosov, V. N. Zhukov and Ye. D. Ryzhikov, Department of Neuropharmacology, Institute of Pharmacology, USSR Academy of Medical Sciences; Chair of General and Special Electrotechnology, People's Friendship University, USSR Ministry of Higher and Intermediate Specialized Education, Moscow]

[Abstract] Existing Soviet microiontophoretic devices have been modified to render them more useful in neuropharmacological and neurochemical studies, by the incorporation of an inbuilt ammeter, timer and time marking accessories [Rayevskiy, V. V. and Sherstnev, V. V., ZHURN. VYSSH. NERVN. DEYAT., 27(1): 211, 1977]. Description is provided for the circuitry of the apparatus, which weighs 2810 g and has the dimensions 9 x 17 x 17 cm. The device has been successfully tested on anesthetized and awake rats and represents an inexpensive Soviet constant current source in distinction to expensive foreign alternatives. Figures 2; references 7: 4 Russian, 3 Western.

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CSO: 1840/2266

## FOUR CHANNEL MICROIONTOPHORETIC DEVICE WITH FIELD EFFECT TRANSISTORS

Moscow ZHURNAL VYSSHEY NERVNOY DEYATELNOSTI in Russian Vol 34, No 2, Mar-Apr 86  
(manuscript received 22 Mar 85) pp 400-402

[Article by V. S. Karmanny, A. A. Kvitka and B. V. Zhuravlev, Institute of  
Normal Physiology imeni P. K. Anokhin, USSR Academy of Medical Sciences;  
Engineering Physics Institute, Moscow]

[Abstract] The electronic circuitry is presented for a high-resistance micro-ionophoretic device, capable of operating on high-voltage (to 400 V) lines, utilizing p-type field-effect transistors (2P201, 2PS202). The operational characteristics of the device have been tested with four-channel microelectrodes prepared from Pyrex glass for the delivery of gastrin and neurotransmitters to selected neurons in the CNS. The pilot model has the capacity for micro-electrodes with a greater number of channels, and can be adjusted (at increasing cost) for automated control of microionophoresis. Figures 2; references 5: 4 Russian, 1 Western.

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